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SUBSTANTIAL INCREASE IN NEW SHIPS.

Three battleships, one armored cruiser, two steel training ships and one wooden brig comprise the program of increase carried on in the naval appropriation bill which has just been completed by the house committee on naval affairs. The bill carries appropriations aggregating $78,000,000, $30,000,000 of which is for new construction. No provision is made for submarine boats in the bill, everyone of the three propositions having been rejected in committee by a vote of nine to four. The Lessler bribery charges are directly responsible for this action of the committee. The question of giving the secretary of the navy authority to bid on the Chilian fighting ships which are understood to be for sale was seriously discussed by the committee but no action was taken. There will be, it is believed, little if any opposition to the program of increase proposed in the bill on the part of members of the house.

Other distinctive features of the bill include a proposition to double the number of cadets at Annapolis, for an indefinite period. Under the plan proposed each senator and representative will have an appointment to the academy every two years, and the president will have five additional appointments annually. The limit of maintenance for the academy was increased from $8,000,000 to $10,000,000. Ten additional civilian professors were authorized for the academy to teach mathematics. Besides this $400,000 is authorized for the erection of a steam engineering laboratory, work in which is to be made a part of the regular course at the academy.

A naval station on the great lakes is provided for in the bill. A naval medical laboratory is authorized as an addition to the Brooklyn navy yard, the cost to be $75,000. The marine corps is to be increased by 800 men and sixty-five officers. Last year this corps was increased a similar number. The limit of cost for the construction of battleships, exclusive of armor and armament, is $4,050,000, while the cost of the cruiser is to be $4,250,000. The time limit for the construction of these vessels is fixed at forty-two months, and the declaration is made that this limit will be strictly enforced.

The committee took action on the Holland boat question before the report on the Lessler bribery charges was disposed of. The first motion was for the purchase of the Holland boats. This motion was promptly voted down by the committee. The proposition was at once made that five be purchased, and this motion met the same fate. A third motion was that the Secretary of the navy be authorized to purchase five submarine boats of any description, and this also was defeated.

THE CASE OF NAVAL CONSTRUCTOR HOBSON.

Admiral Taylor, chief of the navigation bureau, has made the following recommendation to the secretary of the navy concerning Capt. Hobson's resignation: "The bureau is reluctant to recommend the acceptance of this officer's resignation, believing that time should be given to him to re-consider his decision and make a trial of the new duties at the station to which he has been assigned, that the government may retain the services of an officer whose record has been so brilliant." Secretary Moody telegraphed the recommendation to Capt. Hobson with the statement that the department approved it and transmitted it to him for his consideration. In his letter of resignation Capt. Hobson said:

"Upon severing my official connection with the navy I beg to make the following standing and permanent request: That upon the approach of war or a similar emergency the president forward to congress the application I hereby make to be restored to the navy and assigned to active duty during the period of emergency. In conclusion I beg to state that I am completely devoted to the navy, regarding the navy's past as the most glorious of records and its future as the most important factor in the working out of our country's role of beneficient world service; and I shall endeavor in every way possible to render service to the navy, purposing during the time of my life to accomplish the very maximum of useful service to the navy and the nation."

It is a questionable proceeding on the part of men who have been educated at national expense to leave the service when they are most desired. There is at present a great need of constructors, owing to the unusual amount of naval work under construction, and if Hobson is sincere in his protestations of devotion he will perform the work assigned to him by the department. This is the only real way for him to prove his loyalty. Opportunities for spectacular display come only once in a life time.

STEEL CORPORATION WINS ITS SUIT.

The United States Steel Corporation has won a second victory in the court of errors and appeals of New Jersey when a decision, reached by a unanimous vote was given, dissolving the injunction granted by Vice-Chancellor Emery restraining the conversion of $200,000,000 of preferred stock into bonds. The present litigation was begun by J. Aspinwall Hodge and others and followed closely a suit brought by Miriam Berger, in which an injunction was obtained in the court of chancery but afterward set aside by the court of errors and appeals. In the Berger case the court held that ample authority for the conversion of stock into bonds existed in the general corporations act, but at the same time sustained the act of last winter, which was designed to give specific authority to the Steel Corporation, holding that the company had complied with the requirements of the law. In the Hodge case counsel for the complainants sought to introduce new reasons for enjoining the plan of conversion, all of which, it appears, were successfully controverted by counsel for the company. Judge Van Syckel said that the decision of the court of errors sustained the Steel Corporation at every point and left the complainants without a leg to stand on.

An inference drawn by many from the stock movement which followed the decision, was that the corporation had fought this case to a finish largely for the moral effect, and that the stock conversion plan, the validity of which is now apparently fully established, would be dropped, for the proposition to convert $200,000,000 of preferred stock into bonds has not in the past been regarded by Wall street as a "bull argument." No expression as to the probable course to be pursued, however, could be obtained from leading Steel Corporation interests. A similar uncertainty exists as to the likelihood of the issuance of $50,000,000 additional bonds, a plan which it has been declared several times by directors of the Steel Corporation, was bound up with the stock conversion plan.

The resolution for the retirement of $200,000,000 7 per cent. stock and the issuance of $250,000,000 5 per cent. bonds, of which $200,000,000 should be exchanged for preferred stock and $50,000,000 sold for cash, was adopted by the directors of the United States Steel Corporation on April 1, 1902, and was ratified by the shareholders on May 19. The purposes to which the proceeds of the $50,000,000 of new bonds were to be devoted were stated to be: For reimbursing the corporation for cash payments already made on account of construction under way by subsidiary companies at the time of the formation of the Steel Corporation, $15,000,000; for properties purchased almost immediately after the organization of the corporation, $10,000,000; for improvements, $25,000,000. Since that estimate was made, however, the corporation has been making enormous earnings, its net profits for the year 1902, after the deduction of all dividend, interest and sinking fund requirements and of $24,000,000 for depreciation, reserve and improvements, having been $33,841,565. The corporation now has on its books the largest amount of unfilled orders in its history, and is assured for at least a considerable time to come of a continuance of its remarkable prosperity; and these facts incline Wall street to the belief that the directors will either find it advisable to meet the entire $50,000,000 expenditure out of the accumulating surplus or will decide to issue a much smaller amount of bonds than $50,000.000.

The action upon which the court of errors and appeals announced its decision was brought on July 7, 1902, by J. Aspinwall Hodge, Jr., Bernard Smith and William H. Curtiss. Franklin W. Hopkins of the stock exchange firm of Hopkins Bros., and Russell Sage, were joined with these men as parties plaintiff, but promptly withdrew the use of their names. The complainants applied to Vice-Chancellor Emery for a temporary injunction restraining the stock conversion, and obtained one, pending the hearing on a rule to show cause. On Oct. 29 the vice-chancellor filed his decision, granting a preliminary injunction on the understanding that the defendants might take an appeal to the court of errors and appeals. The bill of Mr. Hodge and his associates differed in several particulars from that which had previously been filed by Mrs. Berger, upon which the court of errors and appeals on Sept. 19 handed down a decision in favor of the Steel Corporation. One of the allegations presented in the Hodge bill was fraud, and another that the corporation's assets, after deducting the amount of its indebtedness, did not equal the amount of the outstanding preferred stock. The vice-chancellor, however, while discussing at length the various questions raised, granted the injunction solely upon the technical ground that the stockholders' meeting at which the retirement of the preferred stock was authorized had been prematurely held.

SUPERVISING INSPECTORS OF STEAM VESSELS.

The annual meeting of the United States Board of Supervising Inspectors of Steam Vessels, held in Washington recently, was of more than usual interest. On Tuesday of last week the inspectors as a body went to Philadelphia upon the invitation of Worth, Bailey & Co. of that city and witnessed a test of Brown's improved patent furnaces at Cramp's ship yard, which appears to have been in the highest degree satisfactory. It is a new corrugated furnace, the invention of John Brown & Co., Sheffield, England, the American rights of which have been secured by Worth, Bailey & Co. The test was a compression test to the point of destruction. The flues bore a pressure of 1,250 lbs. per square inch before they collapsed. Nearly all the leading boiler makers of the United States and Canada were there to witness it. Every one was very much interested in it and the boiler committee of the board of supervising inspectors, consisting of Messrs. Rody of New York, Cotter of New Orleans and Oast of Norfolk, made a report in its favor. This report was unanimously indorsed by the board.

A delegation of steamship men in the coastwise passenger service appeared before the board and urged it to recommend that the same system of fog signals at present observed on the great lakes be introduced on the ocean. The statutes provide that after hearing a fog whistle a steamer shall slow down and practically feel its way along until it has seen and passed the approaching vessel. It is not permitted to blow a signal intimating that it is about to alter its course, on the theory that sound is so deceptive that the approaching steamer may mistake the direction from which it comes and alter its course, too, so as to directly run into the other vessel. This statute was formerly applicable to the great lakes but it was never observed by masters of lake vessels. They insisted upon signaling to each other until they had passed. A steamer would blow three whistles continually while in a fog; then as soon as she detected the sound of three whistles from an approaching steamer she immediately began to blow one or two whistles to indicate whether she had changed her course to starboard or port. The approaching steamer thereupon blew the corresponding whistle to indicate that she understood and was doing likewise. This was kept up until they had safely passed each other when the fog signal of three whistles would be resumed. The lake masters persisted in this practice even after the federal authorities called their attention to the fact that they were violating the law in so doing. They persisted in it because they felt it to be the safest and simplest thing to do in a fog. However, as it was in direct violation of law its expediency was questionable should litigation ever arise for damages or for loss of life. A delegation of lake men therefore appealed to congress to amend the statute as far as the lakes was concerned. They represented that in any sort of weather whatever, a steamer with a tow could not slow down to a slight speed without entangling the tow. The justice of the contention was seen and in the White law (rules of the road for the lakes) a system of signals peculiar to the lakes was authorized. Now the coastwise service wants the lake system of fog signals. The lake men among the board of supervising inspectors were in favor of recommending the change to congress but no action was taken by the board.

A clause in the present regulations of the board which provides that one year's service as wheelsman or watchman may count as time served in order to make one eligible for examination for pilot's license was amended by striking out the word watchman. In other words time served as watchman of a vessel does not count as part of the time which must be put in before one may be examined.

The provision that all passenger steamers must be equipped with fire hose and pumps was amended to exempt all steamers under 20 tons.

Capt. Howard Patterson of the New York Nautical College addressed the board on the subject of giving ocean licenses to lake masters. His contention was that if a man is capable of handling a vessel on the lakes and can pass the examination for ocean service, he is capable also of handling a vessel on the ocean. Of course the main objection to this contention is that the ocean experience is necessary. Capt. Patterson said:

"I have the honor to address this honorable board in behalf of a worthy body of men—men who have been often tried in the nautical balance and not found wanting. I refer to the masters and mates of steamships on the great lakes. An injustice was done these gentlemen in a recent decision of the board—not an intentional injustice, perhaps, but an injustice just the same. This board holds that captains and mates having had experience only on steamships on our great lakes are not eligible for ocean licenses; that their service on vessels navigating such inland seas does not give them ocean or coastwise experience within the meaning of the law. This is a discrimination against deck officers of lake vessels, and one need only read the rules in relation to engineers of lake steamers to be fully satisfied on this point. Section 2, paragraph 14, reads:

" 'Engineers of lake, bay and sound steamers who have actually performed the duties of engineer for a period of three years shall be entitled to examination for engineer of ocean steamers.'

"Now, despite years of experience in command of lake steamships, a captain is denied the privilege and advantages from holding an ocean license. Although he is ready and competent to stand the same test in navigation and kindred subjects given to salt water men, he is positively refused an examination. This is neither rhyme nor reason, for it requires the same seamanship and ability to handle a steamship on the lakes as it does to handle one on salt water, and this I contend knowingly as I have commanded vessels on both. When an applicant has studied navigation in all its branches, and is qualified in every way to navigate a ship with safety to any part of the world, it is the height of injustice to refuse him a license for ocean work simply because he has gained his experience on a vessel that floated in fresh instead of salt water. If this ruling is allowed to stand it will mean that the master of the largest and finest lake steamship afloat will be obliged to go to sea on salt water for three years before he can hope to get his license indorsed for ocean work. I therefore, gentlemen, respectfully recommend that service on the great lakes be included within the meaning of 'coastwise navigation,' thus making masters and mates eligible for ocean licenses."

The board, however, maintained that it had but little jurisdiction in the premises. The law provides that a man cannot become a master of an ocean-going steamer until he has served one year on such waters as mate.

SYSTEM FOR EXTINGUISHING FIRES ON SHIP BOARD.

Mr. F. W. Goding, consul to Newcastle, England, contributes the following to the state department at Washington, which will be found of interest to ship owners:

It is well known that fires on board ship are most difficult to contend with; it is next to impossible to find the exact location, there is danger of suffocation in any attempt to go below, and a fire in the center of the cargo can not be reached. The heating of coal cargoes has caused the loss of many ships, and there has been little chance of coping with such a condition except by discharging a portion of the cargo and flooding the hold with water, which is often impossible.

Dr. L. E. Eames of this city has evolved a system for using gas, for which he claims the following:

First.—It will check spontaneous combustion where there are evidences of heating.

Second.—It will extinguish fire if it has already occurred.

Third.—It will prevent the occurrence of an exploson from a mixture of gas and air.

By his method the air in the ship's hold is rapidly mixed with a sufficient supply of gas to make it efficient in arresting a heated condition, the gas being absolutely non-explosive. The apparatus consists of a fairly watertight wooden box or trough, built on the floor of each hold, at the lowest point, and as near the center between the bulkheads as is convenient (in coal bunkers, at the bottom toward one side), and a small pipe leading from the deck to this trough. In coal ships, the thermometer tube may serve for the purpose, and when the ship is carrying a general cargo the tube may remain a permanent fixture. The trough is filled with a few tons of a material about one-half as bulky as coal. This, with some gallons of an easily-stored liquid, comprises the entire outfit. The entire cost of fitting a ship with apparatus sufficient for charging the hold six times is estimated at $100. As the material does not deteriorate with age or exposure to the action of salt water, it may be carried for years, yet it is always ready for use in case of emergency.

TRIAL TRIP OF THE SPRIGG CARROLL.

The steel hull standard screw steamer Sprigg Carroll, second of two vessels recently built by The Pusey & Jones Co., Wilmington, Del., for harbor service of the quartermaster's department, United States army, was given her official trial a few days ago. The trial was in charge of President Pusey, and the government was represented by Maj. I. W. Littell, quartermaster, United States army, from the New York office; Mr. F. H. Burton, inspector, and Mr. George A. Anthony of Washington, marine engineer for the war department. The trial was eminently successful and satisfactory in every respect, the steamer having, in a continuous run of four hours on the Delaware river, considerably exceeded the speed required by the terms of the contract, as well as having displayed general excellence in all points of action and design. The Carroll will be dispatched to New York at an early day. These new dispatch and general utility boats are somewhat out of the ordinary design for harbor service of the army. They are built generally like tug boats, but differ therefrom in being enclosed to side of hull for over half their length, and are thus prepared, in case of need, for some ocean service also.

The mate to the Carroll, the Henry Wilson, completed a short while ago by the same builders, is now doing duty at her station, New London, Conn. These vessels are finely and substantially equipped in every detail and are valuable acquisitions to the quartermaster's department.

ENGLISH SHIPPING LETTER.

Some Tabular Statements Showing Great Progress Made by British Mercantile Marine—Sir. Wm. White's Defense of Shipbuilding Policy—Other Matters.

[From Special London Correspondent.]

London, Feb. 2.—In the discussion attending the question of ship subsidies for your foreign trade vessels you have undoubtedly had all manner of statistics—argument on both sides of the subsidy proposition—dealing with the growth of British shipping and the decline of our own shipping in the foreign trade. Without thought of what may be done by your legislators, but purely as matter of information, there is presented herewith some very interesting, tabular statements showing the bearings of the shipping trade of the leading mercantile countries during the last forty years or so. It is an extraordinary fact, well known, of course, to most of your readers, that of the tonnage employed in the trade between the United Kingdom and the United States of America in 1860, the American portion was largely in excess of the British. In 1870 the American mercantile marine trade showed an enormous contraction and down to 1890 this contraction was progressive. In 1900 American tonnage was again somewhat on the up grade. The following tabular statements have not before been presented in their present form:

FOREIGN TRADE OF THE UNITED KINGDOM—NET REGISTERED TONNAGE, ENTRANCES AND CLEARANCES OF VESSELS WITH CARGO.

	British vessels.	Foreign vessels.	Per cent British.
1900	52,332,155	27,525,989	65.5
1890	46,406,250	16,429,825	73.9
1880	35,885,868	13,793,082	72.2
1870	22,243,039	9,381,641	70.3
1860	12,119,454	8,718,464	58.2
1850	.....	.....	66.9
1840	.....	.....	69.6

TRADE BETWEEN UNITED KINGDOM AND UNITED STATES IN SAIL AND STEAM VESSELS, CARGOES AND BALLAST.—TABLE SHOWING NET REGISTERED TONS EMPLOYED, VESSELS OF BRITISH, AMERICAN AND OTHER FOREIGN COUNTRIES.

	British vessels.	American vessels.	Vessels of other countries.
1900	11,640,114	549,025	1,471,524
1890	8,219,872	259,965	849,883
1880	7,613,795	653,858	1,816,075
1870	2,675,396	832,268	299,585
1860	1,025,922	2,339,101	178,134

TRADE BETWEEN UNITED KINGDOM AND BRITISH POSSESSIONS, CARGO AND BALLAST, NET REGISTERED TONS OF VESSELS.

	British.	Foreign.
1900	10,226,921	1,225,960
1890	9,137,840	1,329,723
1880	8,264,595	1,167,542
1870	5,495,050	548,978
1860	4,333,868	733,398

TRADE BETWEEN UNITED KINGDOM AND BRITISH NORTH AMERICA, CARGO AND BALLAST, NET REGISTERED TONS OF VESSELS.

	British.	Foreign.
1900	2,911,867	643,320
1890	1,794,755	816,926
1880	2,412,458	679,547
1870	1,799,514	261,773
1860	1,595,483	251,455

FOREIGN TRADE OF CHIEF MARITIME COUNTRIES, IN AND OUT, CARGO AND BALLAST.

Country.	British percentage 1890.	British percentage 1900.	Total Trade. Volume, 1890.	Total Trade. Volume, 1900.
Russia	53.2	37.3	12,072,988	16,879,384
Norway	14.6	10.9	5,354,130	6,159,015
Sweden	20.5	9.9	10,766,711	17,123,126
Denmark	No separate British		8,032,080	11,753,567
Germany	35.4	26.9	21,106,980	29,207,857
Holland	49.8	41.7	6,844,034	18,890,462
Belgium	53.2	44.6	11,589,148	16,977,646
France	44.0	40.6	28,967,848	38,286,445
Portugal	53.5	56.8	10,564,723	19,960,318
Spain	No separate British		23,910,898	28,477,569
Italy	49.4	19.7	14,246,724	39,510,262
United States	52.8	54.4	30,794,653	47,151,255
Chili	47.1	50.1	5,739,715	5,991,270
Argentina	42.8	29.3	11,847,424	13,364,884
Japan	No separate British		3,166,404*	7,840,415
Canada	51.6	61.0	10,328,285	14,175,121
Newfoundland	93.0	78.7	634,147	1,447,481
Cape of Good Hope	87.9	89.8	2,957,377	9,504,922†
Natal	93.4	90.2	992,452	2,822,719
New Zealand	87.4	91.8	1,312,474	1,679,907
Australian Com'nw'th.	87.6	85.2	14,248,806	23,704,204

*Year 1889.
†Includes government stores but not troops.

It has often been said, in regard to the sudden decline in the American Atlantic tonnage between 1860 and 1870, that it was entirely due to the war of the union. As a matter of fact, whilst the war had a most serious adverse influence upon American shipping, yet the real cause, as viewed from this side, was the revolution in ship building created by the British building of iron vessels and the gradual supercession of hard wood boats by iron and subsequently by steel built vessels. It may be assumed, further, that at the special juncture of affairs in 1870 the American nation had much more urgent problems to face than that of Atlantic transit. Land transit was of much more vital importance, and accordingly we observe an immense fund of energy expended upon the building of American railroads and the development of internal communications generally during the period under review. This is an old story but there is still another reason. Probably I am treading upon forbidden ground in referring to it. I venture to hint, however, that the decline of American shipping and the simultaneous growth of British shipping may largely be accounted for by the protective tariff of the United States. This may have been brought about in two ways—(a) by the increase in the cost of iron and steel, so that until quite recently ships could not be built in American yards as cheaply as in British yards, and (b) that in consequence of the expansion of free trade methods in this country it has followed that Great Britain has slowly and surely become the sea carrier of the world. Another consideration suggesting itself is that the United States protective tariff has given to American capitalists a great counter attraction by artificially increasing the profits of certain domestic industries. Assume, for example, that under free competition on the high seas, ship owners cannot reckon on more than 5 per cent. profit on their capital, but that the same amount of capital invested in a protected home industry will yield 10 or 20 per cent. Clearly, under such conditions, spare capital will flow into the protected industries, and shipping will be neglected. These are the facts which suggest themselves to me as a resident in this country, and it is just possible that I may be biased because I live where free trade is prevalent. I am, however, quite conversant with American life and American commerce, and I commend the facts here touched upon to the careful consideration of those Americans who are anxious to develop the ship building industry.

It is true that Great Britain has now a great start, not only in tonnage but in ship building experience and organization. At bottom, however, the ruling factor in favor of Great Britain's mercantile supremacy is the inflow and outflow of commerce into British ports, directly the outcome of a free trade policy.

WHITE'S DEFENSE OF SHIP BUILDING POLICY.

Sir William H. White, K. C. B., the ex-director of naval construction in this country, who some time ago had to resign the post mainly on account of ill health, is issuing what is, in effect, an apology, in which he replies to the numerous critics who buzzed like gnats round him during his period of office. I do not propose to give the full details of Sir William White's defence of his ship building policy, but one or two points are of general interest. In the first place, it is clearly wrong to attribute policy in Great Britain to the chief naval constructor. On this point Sir William White says:

"Were not great public interests involved, I should have kept silence, but it is desirable to have no misunderstanding on this important matter. My duty and responsibility have been to design and direct the construction of strong, safe and seaworthy vessels, having the offensive and defensive powers speeds and coal supplies determined by successive boards of admiralty. That duty I claim to have fulfilled during the period (1885-1902) of strenuous effort and unprecedented ship building programs while I held office as director of naval construction. The existing fleet of today represents the intentions of the admiralty in regard to its fighting efficiency as expressed at the date when the designs were prepared and approved."

A complaint made by Sir William is that comparisons have frequently been drawn between ships constructed by him and ships of the same class constructed in other countries at later periods. If ships are to be fairly compared they must have been designed at the same time. Improvements in machinery, guns, armor, and materials are rapid and continuous. Ships designed at a later date get the benefit of such improvements, and can be made more powerful or swifter on given dimensions. Completed ships are degraded in value by lapse of time, and it is not uncommon to find ships described as comparatively obsolete when they are in early periods of service. These considerations affect all fleets and give substantial advantage to the navies which have been most recently developed. It is this constant improvement in all the parts of a ship that necessitates the constant reconsideration of ship building programs and of the types of ships, in order to keep abreast or ahead of possible rivals.

The brunt of the attack on Sir William White has been, in the main that ships built for the British government of large displacement have not given a corresponding efficiency. It is to this class of criticism that he devotes most attention. On this point he says:

"Broadly stated, one great cause of the larger nominal displacements of British ships is to be found in the heavier loads they carry of armament, armor, coals, provisions, stores and equipment. In their loads as designed is also included a 'board margin' for contingencies or additions which may be desired during construction. Every addition to the load carried at the required speed and draught of water is multiplied in additional displacement—it may be two, three, or more times, according to

circumstances. With equal skill in design and identical conditions in other respects the more heavily loaded ship must be the larger. Every diminution of load tends to lessen displacement. There is every inducement, therefore, to carry no weight that is not really an aid to sea-keeping power or fighting efficiency.

"Proposals have been made to reduce supplies of ammunition in British ships, or to carry smaller weights of provisions, stores, and equipment, or to restrict the elaboration and weight of fittings. It may be taken for granted that all these and cognate matters have received, and will receive, due attention from the admiralty, with whom the decision rests as to what is necessary. Changes of this nature, however, in no way affect what has been said above as to existing ships, and the causes influencing their relative displacements."

It is not necessary to follow Sir William White into his remarks on gun power and the technique of shot and shell as elements in actual fighting.

ADVANCE OF AMERICAN SHIPPING IN THE FAR EAST.

However predominant Great Britain may be upon the Atlantic in the shipping world, it is becoming increasingly evident that on the Pacific America is making enormous headway, even to the detriment of the prestige of British shipping. Any facts bearing on this point are interesting and suggestive. I have before me some particulars relating to the shipping tonnage entered at the ports of Kobe and Osaka in Japan. The following tabular statement tells its own story:

	TONNAGE IN THOUSAND TONS				
FLAG.	1897	1898	1899	1900	1901
British	1,294	1,338	1,119	1,180	1,211
Japanese	663	800	981	988	1,121
German	189	206	170	371	430
American (U. S.)	89	85	117	114	138
French	112	113	113	113	112
All others	106	110	78	100	103
Total	2,453	2,652	2,578	2,866	3,115

Taking a retrospect over the last five years, it will be seen that British shipping is barely holding its own, whilst those of its three younger rivals, Japan, Germany and America, have been steadily advancing. In 1897 British tonnage was half of the total entries, Japanese only a quarter. Last year the former had dwindled to little more than one-third, whilst Japanese advanced to fully one-third. German and American tonnage taken together amount now to about half of the British or Japanese, but the German has advanced much more swiftly than the American, rising from 189,000 tons in 1897 to 430,000 tons in 1901, as against the American rise from 89,000 tons in the former year to 138,000 tons in the latter. French tonnage has remained stationary throughout the quinquennium, being confined to the fortnightly mail steamers of the Messageries Maritimes, say fifty-four steamers in the year, averaging a total of about 112,000 tons. The Austrian tonnage, steamers of the Austrian Lloyd's Line, running every three weeks, amounts to about half that of the French.

SHIP BUILDING IN BALTIMORE.

The Baltimore Journal of Commerce recently published a review of the year's industrial work in Baltimore. Concerning the ship building of the Baltimore district it says:

The record of the ship building yards of Baltimore fell somewhat below that of 1901, but this fact affords no ground for pessimistic reflections, because that year happened to be a notable exception, the total of new tonnage constructed being swelled to an unusual degree by several large and unusual orders. It should also be noted that the fire at the Sparrows Point works of the Maryland Steel Co., prevented the launching of the Atlantic Transport liner Missouri at the appointed time, which would have augmented the tonnage considerably. As it is, 1902 shows a considerable advance over 1900 and is even ahead of 1899, which, with the exception of 1901, has a larger tonnage to its credit than any other year since 1882. The record of the Baltimore yards for this period has been in the main one of steady progress. In 1892 there was a boom, occasioned by a large amount of government work, when sixty-one vessels of a total capacity of 17,277 tons and a value of $1,000,000 were turned out, while the year before, though greatly behind it in the number of vessels, exceeded it in the value of the bottoms constructed. But with these exceptions, the advances were rather small until 1899, when the tonnage suddenly jumped up from 9,185 tons, valued at $689,385, to 18,384 tons worth $1,633,300. The record for 1902 of vessels of a capacity of 19,477 tons and a value of $1,847,800, therefore, is highly creditable and satisfactory. This year, with the two large twin ships for the Atlantic Transport Line going off the ways, an excellent start will have been made and a new record may be established. Given in detail the work of the ship building yards is as follows:

Two steel steamers for the United States revenue cutter service were launched by the William Skinner Ship Building & Dry Dock Co. They are the Mackinac, for service on the great lakes, and the Winnisimmett, for harbor duty at Boston. A small steamer for the light house service, to be called the Juniper, is nearly ready for launching, and a sea-going tug 110 ft. long has been contracted for.

A number of yachts and other boats were set off the ways at the yards of the Nilson Yacht Building Co., among them being the steam yacht Constant, the power yachts Petrolia II., Comfort, Bertha, Sparrow, Night Owl, Annie Flood, Letitia, Scylla and Minnie H. A number of small power yachts, launches, gigs, cutters and whaleboats were also constructed. A 54-ft. auxiliary yawl, to be named the Idleon, has been nearly completed for William E. Heiser.

The Cheseapeake Ship Building & Dry Dock Co. launched the steamer Weetamo for service on Lake Sunape, the propeller steamer Caroline for the Baltimore & Queen Anne's Railroad and two steel automatic barges for the New York Weighing Barge & Coal Co., and rebuilt the Norwegian steamer Hero, which was badly damaged by being ashore in the harbor of Colon. Work is now under way on a steamer to be named the Magnolia for the United States light house service.

Scow construction occupied much of the attention of the William Skinner Ship Building & Dry Dock Co., which launched the cabin freight scows Lexington and Keyser for the Baltimore & Ohio Railroad and has under construction four other similar craft, two of them for the Baltimore & Ohio and two for the Merchants' & Miners' Transportation Co.

Among the work done by the William E. Woodall & Co. was the steamer Memphis and two freight barges for the Southern Railroad and one for a local order. The steamer Norfolk-on-the-Roads was rebuilt, a large mud scow was completed and work is in progress on a three-masted wooden schooner.

From J. S. Beacham & Bro.'s yard was launched the three-masted wooden schooner Brazos for the gulf of Mexico trade, and there is on the stocks a duplicate of the same vessel to be sent off the ways early this year.

The tug boat Sea King and a large tug for P. Daugherty & Co. were turned out by Thomas McCosker & Co., which firm has also under construction three six-pocket scows for the Maryland Dredging & Contracting Co.

The Sanford-Brooks Co. has added to the local fleet a tug boat to be used by the corporation in its harbor work.

Twelve freight scows, several of them covered, were sent out from the yard of Charles Rohde & Co.

The fishing steamers William S. Brusstar, Atlantic, Ardent and Icycle were built by the Baltimore Marine Railway, Machine & Boiler Works. A fine steamer for the Messrs. Hurst of Baltimore is now ready for launching.

The record for the various years of tonnage and value of new bottoms for the years since 1882 is as follows:

Year.	Vessels.	Tonnage.	Value.
1882	24	3,152	$ 334,000
1883	19	3,116	331,200
1884	16	2,342	238,250
1885	8	2,514	287,000
1886	7	648	104,500
1887	7	2,500	340,000
1888	8	4,388	728,725
1889	10	4,679	561,375
1890	16	7,307	986,800
1891	20	6,734	1,591,000
1892	61	17,277	1,000,000
1893	36	5,656	639,200
1894	17	2,901	303,800
1895	12	2,033	166,900
1896	19	5,083	327,799
1897	41	8,427	645,175
1898	42	9,185	689,385
1899	44	18,364	1,633,300
1900	44	15,029	1,645,570
1901	39	24,716	2,657,170
1902	45	19,477	1,847,800
Total for 21 years	536	161,828	$17,057,904

The British cruiser Andromeda, before going into dry dock for repairs, underwent a trial in Stokes bay recently, the result of which caused considerable surprise to the naval authorities at Portsmouth. She attained a speed of 22 knots, which was 1.4 knots greater than that attained at her official trial. This result is most remarkable because the cruiser had not been in dry dock for eighteen months and had just returned from a cruise of 40,000 nautical miles. The boilers of the Andromeda have now been taken completely apart at Portsmouth and inspected. They were found to be in perfect order and the vessel could have gone immediately to sea. The hull of the Andromeda was built at the navy yard at Pembroke; the engines are of 16,500 I. H. P.; and the boilers of the Belleville type were installed by Messrs. Hawthorne, Leslie & Co. of Newcastle.

A German cruiser just launched at Kiel, and named Undine, is a sister ship to the Franenlob and Arcona, both launched last year. She is of 2,715 tons displacement, 8,000 H. P. and a speed of 22 knots. Her armament will consist of ten 4.2-in. quick-firing guns and ten smaller guns, with four torpedo tubes.

SCOTTISH SHIP BUILDING LETTER.

Glasgow, Feb. 2.—There is little to report of ship building since the last letter. In addition to the order for liners already reported, Wm. Denny & Bros. have booked a contract for a large steamer for the Union Steamship Co. of New Zealand. But for builders of cargo boats there is no light ahead, nor is there any present prospect of relief in the matter of costs of material. On the contrary German makers have been selling out so freely, and have got so many orders from America that they are retiring from our markets and advancing their quotations. That, and the continued demand for iron and steel in the United States seems to point at higher rather than lower prices for ship building material. In the way of launches January is always a quiet month, broken as it is with holidays and irregular working when the men do start. The question of the reduction of wages is still before the men, who have endeavored to get the employers to confer with a delegation from all the trades unions concerned. The ship building employers, however, have replied that they prefer to deal with each trade separately and will receive them all in turn. The men do not dispute that the trade is falling off, but they maintain that the employers are in too great a hurry to reduce wages after the long spell of activity they have had. Outsiders, however, have wondered why ship builders did not begin to reduce wages six months ago.

At the annual general meeting of the Clyde Steamship Owners' Association the chairman, Mr. T. W. Macintyre, ship owner, said that, apart from other matters which have been engaging their attention, the directors had been closely watching the proceedings of three parliamentary committees—the subsidies committee, the manning committee, the light load line committee. On the question of freights, he said he was in the painful position of having only condolences to offer on the work of the preceding twelve months. Freights had fallen to a minimum, and the new year opened with a prospect as gloomy as had ever been presented to the present generation. The whole history of the shipping trade shows alternating periods of prosperity and depression, and how long the present depression may last was not revealed to anybody. This, however, one knows, that produce and manufactures must continue to be carried over the seas, and as they can not possibly be indefinitely carried at a loss to the ship owner, freights ultimately must return to a paying basis. This position, Mr. Macintyre thought, had been brought about in an aggravated degree by the long continuation of the South African war. The war broke out at a time of prosperity in the shipping trade, and the withdrawal of an enormous amount of tonnage for government purposes increased the pressure and artificially raised freights. Induced by the returns their vessels were earning many owners placed orders for further new and large steamers, with the result that those vessels were coming on the market about the close of the war, just when the government was enabled to let loose a large proportion of the tonnage which was removed from the general market for the previous two years. It was not necessary, however, to be too despondent, as, taking into account the diminution in building which was likely to result from the present condition of the freight market, the trade has a double righting power, first in the natural increase of trade and second in the wastage by loss and age. With regard to recent development Mr. Macintyre said that the matter which most attracted the attention of the public towards shipping during the course of the past year was what is commonly called the Atlantic combine. The shareholders of the White Star Line, or any other line, have a perfect right to sell their shares to anyone who offers what the holders consider to be their value, or more than their value; but ship owners cannot affect not to be interested by the appearance of a new element in the Atlantic trade. How far-reaching the new development may be we have at present no means of ascertaining. If it is to be worked as a shipping concern purely and simply, and if we cannot hold our own, it is entitled to the field. But if it is to be run with the weight of several gigantic American railroads at its back, caring not whether they win or lose on the oversea trade, then a situation arises which becomes a matter for the country and the government. The government has already shown itself alive to the position by the arrangement with the Cunard Line. As to the recently published report of the subsidies committee Mr. Macintyre thinks that the opinions they expressed seem the only possible conclusions for the committee to have expressed, but it is to be hoped that much good has been done in calling public attention to the odds against which British shipping has to contend. The question of granting subsidies even for services rendered will always be a delicate one, as most of the lines to whom such subsidies are granted, or likely to be granted, are also largely engaged in the cargo carrying trade, and there is no safeguard against these firms utilizing the profits made from the department which renders service to the government to subsidize the department engaged in the cargo trade only so using the country's money in competing with their less favored countrymen. The old question of light dues has been much in evidence this year, and a bill drafted by the Liverpool Steamship Owners' Association, after slight alterations by the ship owners' parliamentary committee, was introduced to parliament by Mr. Charles McArthur, but too late to have a chance of becoming law this session. It is to be re-introduced next year, and, in view of the recommendation by the subsidies committee, it is to be hoped will then have the backing of the government. The suggested constitution of the board for the administration of lighthouses, etc., under the bill seems well adapted to attain the greatest degree of efficiency. While heartily concurring in the recommendation of the subsidies committee for the removal of an impost which ship owners have fought against for years and which would bring the practice of our country into line with that of all civilized nations, with the exception of Turkey, the public incline to magnify the extent of the monetary advantage resulting to the shipping trade. The amount per ship per annum is inconsiderable, and the saving of light dues will not make the difference between a profit and a loss on a voyage. Nevertheless, ship owners are delighted to see the principle for which they have so long contended accepted by government, and are thankful for even small mercies.

DOMESTIC TRADE ON RIVERS AND CANALS.

Statistical returns of domestic trade movements on rivers and canals in the United States have been made the subject of monthly reports in the summary of internal commerce issued by the treasury bureau of statistics for the year 1902. A large proportion of this information was gathered from the engineers in charge of river and harbor improvements under the auspices of the war department. In other cases state authorities and transportation companies have furnished data from which the results have been tabulated.

Among the streams of the United States the traffic on the Monongahela river is possibly the heaviest, owing to the prominence of the coal trade. For the twelve months ending with December, 1902, the total coal traffic passing through lock No. 3, in addition to the quantity mined in the first and second pools, was reported as amounting to 9,109,002 tons. This may be compared with the total amount of coal shipped from domestic ports of the great lakes to other domestic ports during the year 1902, amounting to 9,632,866 net tons. The total Monongahela freight movement, in both directions, reached a grand total of 9,686,686 tons in 1902.

The point of largest recorded traffic on the Ohio after leaving Pittsburg is that of Davis island dam, a short distance below Pittsburg. This dam, both in construction and in operation, is one of the country's noteworthy achievements of engineering talent. It affords the coal and iron trade of this portion of the country deep-water navigation on which to accumulate the products of the mines and industries to be floated down the Ohio river whenever a sufficient depth of water is available. The total tonnage passing this point during 1902, as reported by the engineer in charge, was 3,873,952 tons. The month of the largest business was July, when 1,123,990 tons were shipped.

Another point at which traffic on the Ohio is guaged is at Louisville, Ky. Here the Ohio river trade passes either through the locks of the Louisville and Portland canal, or over the falls of the Ohio, in case that the water is of sufficient depth; so that the movement of these two channels gives the total traffic at this point for a given period. For the twelve months ending with December, 1902, the traffic through the canal amounted to 1,234,422 tons, and that over the falls of the Ohio to 763,551 tons, making a grand total of 1,997,973 tons.

Next in importance to the traffic of the Monongahela and Ohio rivers is that of the Great Kanawha river, consisting primarily of coal and lumber. During the year 1902 the total tonnage moved through lock No. 11 on this stream was 977,101 tons. Next in importance is Green river in Kentucky, through lock No. 1 of which 392,847 tons passed. The Big Sandy river, in the same locality, is credited with 251,511 tons passing lock No. 1. The Little Kanawha had a total freight tonnage of 69,706 tons for the same period. The Des Moines (Ia.) rapids canal carried 55,781 tons. The canal of the Cascades in Oregon reported 25,308 tons of traffic. The Barren river in Kentucky 41,231 tons through lock No. 1. The Black Warrior river (Alabama) through lock No. 3, had a tonnage of 16,105 tons, and the Coosa river, of the same state, through lock No. 3, 3,226 tons, mostly lumber in both cases. On the Kentucky river, lock No. 4, 48,665 tons of freight were shipped, and on the Muskingum river, lock No. 1, 37,380 tons, in 1902.

The tonnage moved through the New York state canals is reported by the state superintendent of public works as amounting to 3,179,362 tons in 1902. Of this amount 2,225,986 tons moved eastward and 953,376 tons westward, showing that the eastward tonnage is about two and a half times the westward tnonage. For the year 1901 the total tonnage for an equal season ending with November was 3,111,444 tons, of which 2,276,909 tons moved eastward and 1,066,085 tons westward. Coal shipments on the Chesapeake and Ohio canal were 192,535 tons in 1902, compared with 229,393 tons in 1901.

The above traffic movements may be contrasted with those of the Sault Ste. Marie canals, through which a freight tonnage of 35,961,146 net tons passed in the season of 1902; and also with the Portage lake ship-canals of Michigan, on which cargo of 2,686,189 net tons passed in the same season.

NEWS OF THE GREAT LAKES

OFFICERS OF STEEL FLEET.

Names of captains and engineers for the 113 vessels (seventy-one steam and forty-two sail) of the Pittsburg Steamship Co. for 1903 have been announced from the Cleveland office. The list is as follows:

Steamers.	Masters.	Chief Engineer.	1st As. Engineer.
Bartlett	H. Gegoux	G. A. Gardner	W. A. Rehder
Bessemer	J. A. Walsh	J. B. Heyward	Joseph Parr
Black	A. J. Talbot	John Hegemer	J. W. Popp
Briton	M. C. Cameron	A. G. Haig	Harry Firby
Bunsen	D. P. Wright	A. McGillivray	P. A. Rivers
Cambria	A. G. Tappan	H. L. McLeod	W. H. Roach
Colby	Mat Langel	T. J. McDonnell	A. A. Sampson
Colgate	Oscar Olsen		
Coralia	John F. Parke	Alex McKenzie	C. Wiltoncox
Cornell	C. Z. Montague	A. L. Eggert	J. H. Riggin
Corona	P. A. Petersen	W. G. Tilton	John Sutton
Corsica	W. J. Hunt	J. J. Norcross	M. J. Carroll
Cort	E. O. Whitney	Aubrey Rivard	J. A. Larmer
Crescent City	A. R. Robinson	Irwin Marshall	A. E. Buddemeyer
Eads	M. K. Chamberlain	W. J. Harsant	George Johnson
Edenborn	George Bell	E. S. Stoddard	P. Wilson
Ellwood	Fred A. Bailey	G. C. Lawrence	J. B. McDermid
Empire City	R. F. Humble	Frank Mansfield	G. L. Barnhart
Ericsson	W. S. Hoag	A. P. Williams	J. J. McCarthy
Fairbairn	F. J. Crowley	D. A. Black	Neil McNeil
Fulton	S. C. Allen	Jas. L. Walker	E. R. Leedham
Gates	R. J. Lyons	J. W. Greiner	E. Ducharme
German	Geo. H. Banker	E. H. Larned	Fred Schoeneman
Gilbert	Walter C. Iler	Henry Chalk	Geo. Trevillion
Grecian	F. C. Watson	M. B. Sturtevant	H. M. Lubahn
Griffin	A. C. Smith	Orrie Gilmore	A. E. Wright
Harvard	John Ward	C. H. Burke	George H. Barth
Hill	W.B. MacGregor	Frank Schwartz	Harry Roberts
Houghton	A. C. Chapman	J. W. McEachren	B. Cassady
Hoyt	R. H. Brooks	G. E. Cunningham	Daniel Harkins
Joliet	Chas. Weitzman	George Lynn	Jos. Walker
Lafayette	Richard Jollie	Levi Walder	J. A. Popp
La Salle	H. G. Harbottle	Jos. R. Hall	Wm. E. Vogt
Linn	Jas. W. Morgan	Herman Dupont	John Hoff
Manola	Wm. Pardo	Wm Densmore	Wm. Hasler
Mariska	C.Gegenheimer	Silas H. Hunter	W. A. Marshall
Maruba	J. La Framboise	George Arnold	A. L. Newman
Matoa	H. J. Regan	E. J. Rae	F. McDonald
Marina	C. E. Copeland	G. A. Brown	A. H. Meldrum
Masaba	James Burr	L. F. DeMay	A. W. Snider
Maritana	H. Culp	C. A. Fletcher	Jas. McNamara
Mariposa	Frank Rice	John B. Miller	R. B. Huston
Maricopa	R. E. Byrns	F. A. Smith	F. E. Gilbo
Mataafa	C. E. Moody	R. W. Hunter	F. J. Spencer
Maunaloa	C. H. Cummings	Frank Harringer	H. F. Bangs
Malietoa	Fred Hoffman	Thos. Treleaven	Wm. J. Baird
Mather	J. H. Buchanan	J. H. McGlenn	Walter Woodruff
McDougall	Neil Campbell	Fred Warning	W. J. Davidson
Morse	E. M. Smith	E. W. Fox	J. A. McPhee
Murphy	W. H. Moody	Henry Annett	D. Milloy
Neilson	J. R. Noble	A. P. Williams	J. A. Bennett
Poe	John Lowe	W. L. Campbell	E. Mettetal
Palmer	Geo. Randolph	F. L. Smith	Chas. Tyler
Princeton	M. A. Boyce	M. Toner	Lewis Griggs
Queen City	W. H. Campau	F. G. Carey	W. D. Killett
Rensselaer	W. E. Chilson	John Dupont	Jos. Hasler
Rockefeller	John Nahrstedt	Thos. Kelley	Wm. Clucas
Roman	H. Kerr	Wm. Dornbrook	E. H. Pelton
Saxon	W. A. Reed	R. Martin	Wm. P. Diamond
Shaw	John Burns	E. J. Fitzgerald	W. T. Smith
Siemens	F. W. Stenton	Duncan McVicar	C. B. Culver
Stephenson	C. J. Grant	S. W. Armstrong	A. J. Armson
Superior City	James Leisk	Geo. McLaughlin	Jas. Hally
Superior	Hay Hursley	Geo. Ingham	John J. Kelly
Thomson	W. E. Stover	W. J. Hacket	Chas. Kreidler
Trevor	A. W. Burrows	Thos. McKenzie	John Mraz
Van Hise	C. D. Secord	John McLaughlin	Harry Flood
Watt	W. H. Kilby	A. W. Armson	H. E. Schmidt
Wawatam	F. W. Light	W. P. Tindall	Arthur Armstrong
Wolvin	E. Dyble	J. F. Wood	B. J. McCabe
Zenith City	John Dunn	A. Jackson	S. D. Graham

Barges.	Masters.	Barges.	Masters.
Bell	J. Y. Sprowell	Smeaton	Geo. Holdridge
Bryn Mawr	T. J. Cullen	Thomas	Donald Graham
Carrington	G. W. McCallum	Whitworth	Thos. P. Thompson
Corliss	A. Nordahl	105	H. Harris, Jr.
Fritz	A. E. Huff	107	Dan McFadyen
Holley	O. W. Holdridge	109	Geo. Maloney
Jenney	C. Mulholland	110	Chas. Thompson
Krupp	H. Walper	111	W. H. Hoffman
Malta	Willard Damon	116	A. G. McLeod
Marcia	David Bouille	117	E. Emanuelson
Manda	J. A. Ferguson	118	F. E. Hale
Martha	Chas. Gordon	126	Alfred Beaupre
Magna	H. M. Saveland	127	Wm. McDonald
Maida	W. F. Allen	130	Edw. Morey
Maia	J. H. Denner	131	J. T. Gemmell
Manila	G. E. Hursley	132	H. P. Foote
Madeira	Louis Leonard	133	P. Gustafsen
Marsala	J. H. Dissett	134	Robt. Thompson
Nasmyth	W. H. Dick	137	C. H. Noble
Roebling	E. L. Sawyer	201	Gust Anderson
Russel	John F. Gray	202	George Foster

Capt. W. W. Smith, superintendent of the Pittsburg company will also appoint the mates in this fleet. Their appointments will probably be deferred until matters regarding the future of the Lake Carriers' Association are fully settled.

MORE NEW SHIPS.

Negotiations pending with the American Ship Building Co. will very probably result in the announcement shortly of several orders for new vessels in addition to the two car ferries of the $400,000 kind ordered this week from the American company by the Pere Marquette Railway Co. The orders under consideration include two large freight steamers for Cleveland owners. It is also understood that the Columbia Iron Works of St. Clair, Mich., expects to close another contract in a few days.

The two car ferries for which contracts were closed a few days ago will be in nearly all respects similar to the big steamers Pere Marquette, Nos. 17 and 18, but they will have no passenger accommodations. One of them will probably be built at the Cleveland yard. The dimensions will be 350 ft. over all, 338 ft. keel, 56 ft. beam and 19½ ft. deep. They will have triple expansion engines with cylinders of 19, 31 and 52 in. diameter and 36 in. stroke. Steam will be furnished by four Scotch boilers, 13 ft. 9 in. in diameter and 12 ft. long, to be allowed 175 lbs. steam pressure. Each of the steamers will have capacity for thirty-two cars. It is expected that they will be completed in December next. Mr. Robert Logan of Cleveland has represented the Pere Marquette company in matters pertaining to design and construction of all their large vessels of this kind.

Quite a social event was made of the launching of the steamer W. H. Mack at the Cleveland yard of the American Ship Building Co. last Saturday. Miss Irma Squire christened the vessel. The new steamer is 374 ft. over all, 354 ft. keel, 48 ft. beam and 28 ft. deep. She will have triple-expansion engines with cylinders of 20, 33½ and 55 in. diameter and stroke of 40 in. Steam will be supplied by two Scotch boilers, 12 ft. 10 in. in diameter and 13 ft. long. The steel steamer W. S. Mack of the same fleet to which this new vessel will belong will hereafter be known as Capt. Mack. The vessels, owned by the Mack estate, are named for Capt. W. S. Mack and his son, W. H. Mack, both deceased.

The new freighter building at the yard of the Craig Ship Building Co., Toledo, for the Adams Transportation Co. will be named George L. Craig. In size and capacity she will be a duplicate of the steamer Thomas Adams, although she will have more engine and boiler power.

HIGHER PRICES FOR IRON ORE.

Conferences on iron ore prices in Cleveland are nearing an end and it is expected that prices of Lake Superior Bessemer for 1903 will be fixed before the close of the present week. Nothing further than a gentlemen's agreement is expected regarding the non-Bessemer ores. Higher prices than those prevailing last year will be agreed upon, but the extent of the advance has not been announced. The base price for Bessemer last year was $4.25. Mining interests have been so conservative in the past that they have not had, in any of the several periods of higher prices during late years, their share of iron and steel profits. Objection to the advance now proposed is not, therefore, expected even if it should be more than 25 cents a ton. The ore shippers expect to pay a little better lake freight than was paid in season contracts last year. They offer no objection in discussing freights to a basis of 80 cents from the head of Lake Superior. Much of the ore was moved last year at 75 cents. Of course there is no reason for fixing freights as yet, but from the present outlook it would seem that not much in the way of concerted action would be required on the part of vessel owners to establish an 85-cent rate.

PITTSBURG COAL CO.'S PROSPEROUS YEAR.

The third annual report of the Pittsburg Coal Co., just made public, shows the corporation to be in a most excellent condition. Though its policy of acquiring additional coal lands, broadening its market and improving its means of distribution, the company has been able to materially increase its income. The net earnings for 1902 amounted to $4,706,587.12, which is an increase of over 50 per cent. over 1901. In point of tonnage the company increased its production over its operating areas by 1,753,236 tons, a gain of over 13 per cent. These gains have been made in the face of an unparalleled traffic congestion. After setting aside $396,666 for depreciation, $650,660 for royalties, $2,427,146 for dividends and interest, the treasurer's statement still shows undivided earnings of $2,279,440. This fund will be devoted to additional working capital. Among its assets the company holds coal acreage and equipment valued at $77,000,000. The profit-sharing plan is working well, 1,000 employes having subscribed for 8,000 shares of stock.

LAKE CARRIERS' REORGANIZATION.

At the meeting in Detroit today for formal organization of the Lake Carriers' Association practically the entire stock of the association will be represented, although the attendance of members will be confined to a majority of the board of directors, the membership of which was necessarily fixed to a large extent by the committee on organization. The adoption of by-laws and the election of the board of directors is, of course, the principal business from a stockholders' standpoint. It is quite certain that the executive committee, which will practically have full charge of the affairs of the association, answering only to the directors, and that very probably on rare occasions, will be made up of A. B. Wolvin, Frank J. Firth, H. Coulby, H. A. Hawgood and Edward Smith. Of course there is no certainty of these names until they are announced by the directors. Names that will probably be found in the board of directors will include these five members of the executive committee, as well as C. W. Elphicke and D. Sullivan of Chicago, E. T. Evans and T. T. Morford of Buffalo, Wm. Livingstone of Detroit and John Mitchell of Cleveland. The officers will very probably be the same as last year—President Wm. Livingstone, Secretary Harvey L. Brown, Treasurer Geo. P. McKay and Counsel Harvey D. Goulder.

TUGMEN AND EMPLOYERS IN CONFERENCE.

The principal officials of the Great Lakes Towing Co., as well as the local managers, have been in conference at South Bend, Ind., for three or four days past with officials of the Licensed Tugmen's Protective Association. The meetings are for the purpose of agreeing, if possible, upon a contract for 1903, dealing with all labor problems along the lines laid down several months ago when the long struggle between the tugmen and the Great Lakes Towing Co. was settled. Both interests evidently fixed upon South Bend as a meeting place with a view to conducting their business quietly and avoiding outside influences. Both the men and the employers have felt that a settlement could readily be reached for the coming year, but for the unsettled question of what is to be done with the men who remain with the towing company during the strike and who have not been taken into the union. On this score there is still some doubt of a settlement.

AROUND THE GREAT LAKES.

Holland & Graves, Buffalo lumbermen, have bought the steamer Mohegan and consort Mingo. They lost the steamer Charles Hebard last fall.

Capt. D. D. Gaillard, United States engineer at Duluth, calls for bids in an advertisement elsewhere in this issue on the steam yacht Picket which he is offering for sale.

A dispatch from Duluth says that the firm of Corrigan, McKinney & Co. has leased the Winifred and Laura mines at Hibbing from the Great Northern interests. The Great Northern will haul the ore.

Part of the Erie canal within the boundaries of the proposed Niagara river deep ship-canal, which Maj. Symons announced had recently been approved by the government, may be ceded by the state to the federal government if the latter builds this proposed canal.

George Plouffe has brought suit in the United States courts at Cleveland against the steamer E. A. Shores, Jr., for subtraction of wages amounting to $133 with interest from Dec. 20 last. Mary L. Wheeler has brought suit against the same steamer for $42 wages with interest from Dec. 8.

The office of the weather bureau at the Sault is exceptionally well equipped and is very popular with vessel masters. The popularity of the office is largely due to the efforts of the local observer, Mr. Burns, who is always willing, aside from his official duties, to accommodate the vessel men and who has therefore made a host of friends.

A Detroit dispatch says that the Algoma Central Steamship Co. (Clergue interest) will next season operate the steamer Ossifrage on the Sault-Michipicoten route with the steamer Minnie M., and is therefore trying to purchase a passenger steamer to take the place of the Ossifrage on the Toledo, Detroit and Sault Ste. Marie route.

Mr. John A. Donaldson, who was manager of the National Fuel & Dock Co., recently absorbed by the Pittsburg Coal Co., has returned to the Pittsburg company in his old position as manager of the operating department. N. J. Boylan, who was with Mr. Donaldson, has also returned to the Pittsburg company, to look after the sale of steamboat fuel with Fred Sall.

The Lake Superior Contracting & Dredging Co of Duluth was the only concern that answered the advertisement of Capt. D. D. Gaillard, United States engineer at Duluth, for bids on the work of dredging a pier trench at Superior entry, Wis. The job involves about 130,000 cu. yds. of dredging. The bid of the Lake Superior company was 15 cents per cubic yard.

Chicago newspapers have finally concluded that after all there is to be no trust of passenger boats on that lake. There was never any likelihood of success attending the efforts of promoters who tried to merge the Lake Michigan lines. They had no financial backing and were therefore unable to get the managers of the lines down to the figures at which their property could actually be bought.

The annual meeting of the Boutell Transportation & Towing Co., a lake organization which operates on the Atlantic seaboard the tugs Peter Smith and Sweepstakes and the schooners Annie M. Ash and John C. Fitzpatrick, was held last week. The following officers were elected: President, W. H. Becker; vice-president, Charles O. Jenkins; secretary and treasurer, Capt. John Mitchell. These with B. Boutell, C. E. Sullivan and E. U. Pratt are the directors.

The annual ball of the Marine Engineers Beneficial Association, which was held at the Chamber of Commerce rooms in Cleveland on Tuesday evening, was a most successful and enjoyable affair. A great many of the vessel owners and representatives of the American Ship Building Co. attended, and the spacious ball room was crowded with a finely-costumed, well-groomed and animated throng. The banquet was held in the cafe on the upper floor. The committee in charge of the affair are certainly deserving of great credit.

A marine decision of some importance has been handed down by the supreme court in a case appealed by Manitowoc parties. The question involved the ownership of the schooner Emma Neilson of Manitowoc. Charles Reynolds of Sturgeon Bay has a one-third interest and Capt. Paul Neilson has a two-thirds interest in the vessel. Reynolds appealed to the courts for an accounting, alleging that Neilson was in full control of the schooner. The case was dismissed in circuit court for want of jurisdiction but the supreme court has ordered the sale of the schooner and a division of the profits pro rata.

Chief James Foley of the Milwaukee fire department, whose death, announced a few days ago, was due to inhaling with other firemen the fumes of nitric acid, was well known in lake ship building circles on account of his interest in fire boats. He is very highly spoken of by everybody around the lakes who was favored with his acquaintance. The great honor attending his funeral was evidence from the people of Milwaukee of his worth to that city. Among city officials of Chicago, to whom he was almost as well known as in Milwaukee, his death was generally mourned. A fire boat for Milwaukee, costing about $100,000, is now being built by the Ship Owners Dry Dock Co. of Chicago. Mr. W. J. Wood, designer of the fire boat, says, in referring to the interest shown by Chief Foley in the vessel, that he has had about 100 letters from him since the designs were first proposed, and that the chief had all arrangements made on the day of his death, even to the purchase of railway tickets for a visit to the ship yard to see the boat in frame. It would certainly be fitting to name this fire boat James Foley.

The Great Lakes and St. Lawrence river rate committee comprised of representatives of the passenger steamship companies and several of the big railroads in the lake district met in Detroit last week and after an extended conference announced that the passenger rates prevailing last year had been adopted with practically no change. Following were the lake and rail lines represented: Algoma Central & Hudson Bay railroad, Algoma Central Steamship Co., Anchor Line, Canadian Pacific railroad, C. & B. Transit Co., D. & C. and D. & B. lines, Grand Trunk system, Goodrich Transportation Co., Lake Michigan & Lake Superior Transportation Co., Lake Ontario & B. of Q. S. B. Co., Manitou Steamship Co., Montreal, Rochester & Quebec Transportation Co., Muskoka & Georgian Bay Navigation Co., Niagara Navigation Co., Northern Michigan Transportation Co., Northern Navigation Co., Northern Steamship Co., North-West Transportation Co., Ltd., Parry Sound yacht fleet, Richelieu & Ontario Navigation Co., Rideau Lakes Navigation Co., Ltd., Toronto, Hamilton & Buffalo railroad, Windsor, Detroit & Soo Line, Lehigh Valley railroad, White Star Line, Delaware, Lackawanna & Western, Wabash and Michigan Central railroads.

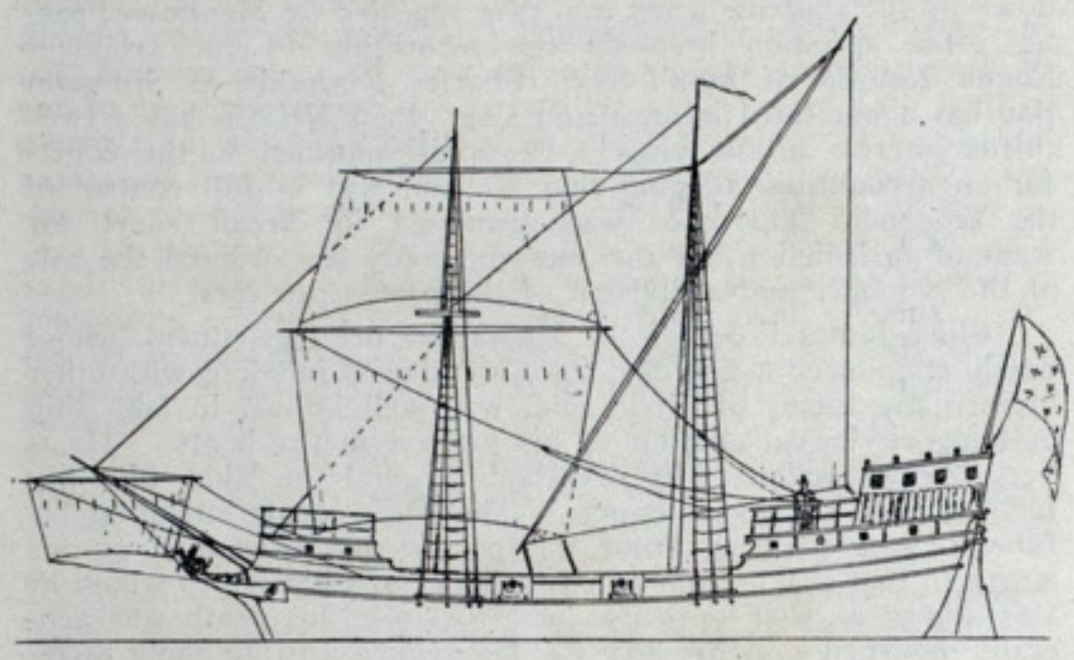
An interesting marine case has just been decided by United States District Judge Hazel of Buffalo, involving the right of salvage compensation to a vessel assisting another in distress. The case was that of the Gilchrist Transportation Co. against a cargo of wheat of the propeller City of Genoa. The Gilchrist company owned the Genoa, as well as the steamer Mecosta, which rendered the assistance for which salvage was claimed, and sued the cargo of the Genoa on behalf of the Mecosta. The Genoa, grain laden, had broken down on a voyage to Buffalo and had been taken in tow by the Mecosta. When near Long point, Lake Erie, the Genoa was discovered to be on fire. She signalled to the Mecosta and the latter vessel rounded to and came alongside, the flames in the meantime having gained considerable headway. The crew of the Mecosta worked the better part of the night with hose and fire buckets, and with the assistance of the Genoa crew, put out the fire. The judge awards $3,800 for the service—$2,300 of the amount to the Gilchrist Transportation Co., as owner of the Mecosta, and the balance, $1,500, to the crew of the Mecosta, giving the master $240, two mates $150 each, two engineers $120 each and twelve other members of the crew $60 each. The case was tried for the Gilchrist Transportation Co. by Mr. George S. Potter of Buffalo and defended for the owner of the Genoa cargo by John C. Shaw of Detroit and Harvey L. Brown of Buffalo.

THE GRIFFIN.

By Richard P. Joy.

Some time ago, while looking over some old books in my library, I came across Father Hennepin's history of his voyages in America with the discoverer La Salle. In this little old leather covered French book, published in the year 1711 and brown with age, I found an engraving showing the first shipyard on the great lakes, with the hull of the Griffin or Griffon, as it is spelled in the original, on the stocks. This old engraving gives a good idea of the hull of the first vessel to sail the inland seas, and from this old picture, and the meager description given by Father Hennepin, I have evolved the drawing as shown.

The Griffin was built on the Niagara river, not far from Buffalo, about two leagues above the falls, at the mouth of Cayuga creek, as pointed out by Parkman, the historian, and was launched in the spring of the year 1679. The vessel was somewhere between 45 and 60 tons burden, both figures being stated by Hennepin in different narratives, carried five guns and furnished accommodations for thirty-four men. I have seen many pictures purporting to be the Griffin, all fanciful pictures, some showing the vessel rigged as a schooner, but as the schooner rig was first introduced in New England in 1714, some years after the Griffin was launched, such pictures could not have been accurate.



The Correct Rig of the Griffin.

It is probable that La Salle obtained the designs for the vessel when in France, and that her rig was the prevailing rig of vessels of that period, as shown by the drawing. On the mainmast the triangular lateen sail, used then universally, and on the foremast the two square sails, also common on vessels of the time. As the triangular jig, or staysail, did not come into use until the early part of the eighteenth century, it is probable that the Griffin carried a spritsail on her high bowsprit. Even as late as the year 1750 the spritsail was common to all sea-going vessels, as many old prints will show.

The Griffin, with her hardy company on board, sailed out of the Niagara river on Aug. 7, 1679, under command of La Salle. The vessel was navigated by an old salt-water seaman, who acted as pilot, and in four days the Detroit river was entered, and along its banks the members of the ship's company killed bears, deer, and other game. Crossing Lake St. Clair, which La Salle named, and sailing up the St. Clair river, the vessel entered the broad waters of Lake Huron, where, when they were well at sea, a fierce gale nearly caused the ship to founder. "Even La Salle called on his followers to commend themselves to heaven. All fell to their prayers but the Godless pilot, who was loud in complaint against his commander for having brought him, after the honor he had won on the ocean, to drown at last ignominiously in fresh waters," but the vessel weathered the gale, and at last safely arrived in the harbor of Michilli, Macinac, where there was a fur trading settlement and Jesuit mission.

The Griffin, after a short stay at Mackinac, set sail for Green bay, on Lake Michigan, and there, at one of the numerous islands, she took on a cargo of furs, and on Sept. 18, 1679, set sail on the return voyage for the Niagara river, in charge of the pilot, La Salle and most of his company remaining behind, and traveling by canoe to the Illinois river on their voyage of discovery. This was the last seen of the vessel and her ship's company, for she was never heard from again, and her fate remains enshrouded in mystery. Thus the Griffin heads the long list of missing ships on these great inland lakes.

Capt. John C. Carey, for nearly twenty-five years employed on steamers of the Detroit, Belle Isle & Windsor Ferry Co., died at the home of his daughter, Mrs. William Corbet of Chicago, last week. He was born in Oswego, N. Y., in 1841 and had practically been identified with the lakes since childhood. His last commission was the Sappho in 1899 when he quit sailing.

TRANSFER OF HILL MINES TO CORPORATION.

Duluth, Minn., Feb. 11.—It is generally supposed that the deal by which the Great Northern Railroad Co.'s mining lands on the Mesabi range go into the hands of the United States Steel Corporation is approaching consummation and may be announced any time. The terms are not definitely given out but are understood to be about as follows: The Steel Corporation to take over the Hill lands in toto, excepting as to those that are already under lease or option to other parties or mining interests; to guarantee the Great Northern $1.80 as royalty and freight to Lake Superior shipping port, which would mean $1 for royalty; to mine no more than needed within certain restrictions, but to guarantee the Great Northern immunity from all minimum output agreements it may have made on the lands in question. The deal is of the utmost importance all round, and takes away from the market any possibility, so far as can now be judged, of any new outside steel-making interest coming in and securing ore lands at anything like low prices or in large quantity; that is in quantity sufficient to make it a competitor of the United States Steel Corporation for a long term of years. The tonnage involved in the proposed transfer is not known. Not even Mr. Hill or the officials of the Steel Corporation are positive on this score, for a large part of the lands have never been explored, but it is supposed that they contain several hundred million tons of fine ore; in fact a great many million tons have been found by explorations carried on by the Great Northern in the past three or four years. The Great Northern's line into the ore region will be operated by it and the profit in the haul at 80 cts. a ton is a very important consideration. In fact it was this possibility of profit and not the royalty nor mining chances that led to Mr. Hill's building into the district.

Of the 60,000,000 ft. of lumber on docks at Duluth at the close of navigation all but about 15,000,000 ft. are sold. Of the lumber being made by five city mills this winter, working day and night, practically all but the cut of one mill is sold. Of the summer cut of 1903 a considerable amount has been sold or placed with buyers at the price at time of delivery. So there is a very large amount of lumber for movement east during the coming season, and there will be a large quantity of dry stock on dock at the opening of navigation that will be moved at once. It is now quite evident that the cut of lumber at Duluth will be materially in excess of that of any past year, while that of the Duluth district, so-called, will be still more above previous years. But the movement of lumber from Lake Superior as a whole will not show so large an increase, as the district of Ashland will probably diminish its cut and the Marquette-Sault mills will scarcely make much more than last year.

There are now 8.400.000 bu. of grain in store at the head of Lake Superior with 5,000,000 bu. at the Canadian ports, Port Arthur and Fort William. A year ago there were some 19,000,000 bu. here and 4,000,000 at the Canadian ports. Grain is coming in slowly and there is little evidence of anxiety on the part of shippers.

Some flour is already arriving for spring shipment east by lake. This is unusually early for receipts from the interior of spring consignments and presages an important movement this way the coming season. One possible reason for these early receipts is the car shortage, which is making it hard for millers to deliver all-rail flour already sold and which causes them to send as much via Duluth-Superior as possible.

Capacity for storage of 2,500.000 bu. grain is understood to be planned for construction this year by the Canadian Northern road. There will be a steel working house and tile annex. The same road has just finished and is filling a tile storage for 2.000.000 bu. and has a wood house of 1,250.000 bu. capacity.

Construction is under way on four new steel steamers at the works of the Superior Ship Building Co. and the number of men is being increased gradually. There are nearly 1,000 men at work now and 1,500 will be busy later. Eighty men are at work in the engine rooms of the Pittsburg Steamship Co.'s vessels laid up here, overhauling machinery. It is quite evident that these ships will be put into commission at the earliest possible moment in the spring, and that no delay on the part of this company need be expected by those anxious to hold the opening till about May 1.

Montreal is looking forward to some trouble on the wharves at the opening of navigation unless the demands of the longshoremen are met. The International Longshoremen's, Marine & Transport Workers' Association has presented to shipping agents a new schedule for 1903. It is considerably higher than that of last year and is as follows: Lumber work (night and day) 30 cents per hour; side storage, 40 cents; coal handlers, shovelers, (day work), 40 cents; coal handlers, shovelers, (night work), 45 cents; hatchmen and drivers, 40 cents; all other employes, (day work), 30 cents; all other employes, (night work), 35 cents; general cargo, (day work), 25 cents; general cargo, (night work), 30 cents; grain, (day work), 40 cents; grain (night work), 45 cents; coal cargo, (day work), 35 cents; coal cargo, (night work), 40 cents.

Capt. Thomas Saveland, formerly a well-known master on the lakes, died at Milwaukee last Friday afternoon.

OFFICERS OF DETROIT TRANSPORTATION COMPANIES.

Nearly all of the transportation companies of Michigan elected officers a few days ago. Most of the Detroit companies are represented in the following list:

Whitney Transportation Co.—D. C. Whitney, president and treasurer; John Dalvell, vice-president; Fred G. Austin, secretary. Directors, above and Charles Stinchfield and Richard Cuson.

Wolverine Steamship Co.—John B. Roby, president; Watson M. Freer, vice-president; Alex. McVittie, secretary-treasurer and manager. Directors, above and Frank J. Hecker.

Michigan Steamship Co.—Frank J. Hecker, president; Frank E. Kirby, vice-president; Alex. McVittie, secretary-treasurer and manager. Directors, above and Watson M. Freer and P. H. McMillan.

American Steamship Co.—Hugh McMillan, president and treasurer; W. C. McMillan, vice-president; M. B. McMillan, secretary. Directors, above and M. W. Aldrich and G. M. McMillan.

Ionia Transportation Co.—F. M. Thompson, president and treasurer; E. L. Thompson, vice-president; W. M. Kelley, secretary.

White Star Line—A. A. Parker, president; L. C. Waldo, vice-president; John Pridgeon, Jr., treasurer; C. F. Bielman, secretary and traffic manager; B. W. Parker, general manager. Directors, above and T. H. Newberry, James H. Muir, Robert T. Gray and A. W. Colton.

Adams Transportation Co.—John Craig, Sr., president; John Adams, vice-president; John Craig, Jr., secretary; Thomas Adams, treasurer and general manager.

Inter-Lake Transportation Co.—P. J. Ralph, president; C. D. Watterman, vice-president; H. C. Ralph, secretary and treasurer.

Duluth & Atlantic Transportation Co.—W. C. McMillan, president; Hugh McMillan, vice-president; Philip H. McMillan, secretary; George M. Black, treasurer. Directors, above and W. K. Anderson.

Teagan Transportation Co.—W. T. Teagan, president; J. O. Teagan, treasurer and general manager; Wade Millis, secretary.

People's Ferry Co.—Clarence A. Parker, president and general manager; C. M. Zengerle, vice-president; Lemuel H. Foster, counsel and secretary; L. P. Sanscrainte, treasurer. Directors, above and Capt. Gilbert LeCroix.

Nipigon Transit Co.—Alfred K. Kiefer, president; David Milne, vice-president; O. L. E. Weber, secretary and treasurer.

Hope Transportation Co.—T. S. Christie, president; C. D. Haywood, vice-president; W. R. Stafford, treasurer; Thomas K. Christie, secretary; John A. Francombe, manager.

Wayne Transportation Co.—John A. Francombe, president and manager; W. G. Teuson, secretary; E. McWilliams, treasurer.

Owen Transportation Co.—J. F. Owen, president; William J. Gray, vice-president and treasurer; Robert T. Gray, secretary.

Stewart Transportation Co.—George Peck, president; A. E. Stewart, vice-president and general manager; C. F. Bielman, secretary and treasurer. Directors, above and J. J. Barlum and George Lesher.

Northwestern Transportation Co.—Harvey H. Brown, president; S. C. Hartnell, vice-president; L. C. Waldo, secretary-treasurer and manager. Directors, above and C. T. Pratt, Robert P. Hartnell and Stephen Hartnell.

Roby Transportation Co.—J. B. Roby, president; John W. Donaldson, vice-president; L. C. Waldo, secretary-treasurer and manager.

APPOINTMENTS ON TWO PASSENGER LINES.

General Manager W. C. McMillan of the Detroit & Buffalo and Detroit & Cleveland lines, has announced appointments of officers for the season of 1903 on the eight side-wheel passenger steamers controlled by the two lines. There are a few new names, especially among the stewards. The list is as follows:

City of Detroit—Captain, A. J. McKay; pilot, Malcolm McLachlan; first officer, Ronald McLean; chief engineer, William S. Huff; purser, D. E. Cummings; steward, Alfred welfare.

City of Cleveland—Captain, Archie McLachlan; pilot, John Lightbody; first officer, Alex. McCollum; chief engineer, John T. Hall; purser, Geo. W. Clark; steward, E. H. Hudson.

City of Alpena—Captain, M. Lightbody; pilot, Wm. Kenyon; chief engineer, A. Phillips; purser, Roy S. White; steward, Chas. P. Derr.

City of Mackinac—Captain, H. J. Slyfield; pilot, Fred Simpson; chief engineer, Wm. McDonald; purser, Geo. F. Sladden; steward, Wm. Smith.

State of Ohio—Captain, A. H. McLachlan; pilot, Kenneth Finlayson; first officer, A. E. Randall; chief engineer, D. Donaldson; purser, Geo. Masson; steward, Richard Collins.

State of New York—Captain, Salem Robinson; pilot, Peter D. Ferguson; first officer, D. McLachlan; chief engineer, Wm. Steen; purser, John Barry; steward, Julius Wehlan.

Eastern States—Captain, Duncan McLachlan; first officer, Hugh McMillan; pilot, Eugene Heywood; chief engineer, J. P. Wells; purser, John Sughrow; steward, Otto Hunter.

Western States—Captain, John McCollum; first officer, Dougall McLachlan; pilot, F. Stuart; chief engineer, A. Carter; purser, D. A. McIntyre; steward, Bert Ransier.

INTERESTING INSURANCE QUESTION.

An interesting question has arisen out of the Grand Traverse-Livingstone litigation. The Grand Traverse was sunk in collision with the steamer Livingstone, Oct. 19, 1896, on Lake Erie. She became a total loss, was abandoned to the underwriters and total loss paid. The case growing out of the collision was tried before District Judge Cox and both vessels held at fault. The Grand Traverse interests appealed, and the United States circuit court of appeals held the Livingstone solely at fault. The value of the Grand Traverse was fixed at $37,500; her insurance valuation was $25,000. The underwriters on the Grand Traverse, when the cause was reversed and remanded, petitioned for the payment of the entire sum to them, claiming that by virtue of the abandonment and payment of total loss they were entitled to all the fruits of the recovery. The owners claimed that the right which the underwriter has in such case arises in the equitable doctrine of subrogation, and is unaffected by abandonment; that the right of the underwriter in the fund recovered is limited to recoupment of the amount of their payment, in this case $25,000. They also contend that as their underwriters took no part in making the recovery of any risk in connection with it and did not contribute to the expense, but, on the contrary being underwriters on the Livingstone as well as the Grand Traverse had contributed toward the defense of the Livingstone; that while under the doctrine of subrogation they would ordinarily be entitled to repayment of the entire sum by them paid if the recovery from the wrongdoer equaled that sum and only chargeable with a pro rata of the expense in this case, by reason of their failure to aid in the recovery, their adverse interest as underwriters in the Livingstone, and their contributing toward the defense of the Livingstone, the expense of recovery should be deducted from their part of this recovery.

The doctrine is not a new one, nor at all peculiar to marine insurance, but while the doctrine is old it seems that there has been no case in which it has been necessary to decide the question, although there are some cases in which it is referred to and considered. The question is interesting at this time, in view of the almost universal use of valued policies and of the growing practice of placing the insurance or policy valuation of the vessel at less than its market value. Under an open policy, in case of total loss, an owner is completely indemnified; under a valued policy, he may get the full indemnity provided by his contract and yet fall far short of being fully indemnified on his loss. Some policies contain stipulations as to the extent of the underwriters' interest in case of payment. The policies in this case are all or substantially all silent on this point, leaving the question purely one of law. The cause has been argued before District Judge Hazel at Buffalo but not finally submitted.

It is reported from Collingwood that Capt. P. M. Campbell, veteran commodore of the Northern Navigation Co.'s fleet, is to retire from active service. He is one of the pioneer captains, if not the very oldest of them, on the upper lakes, having been identified with navigation out of Collingwood for about half a century. There is scarcely a boat in the history of the Collingwood line that he has not commanded. From the earliest days of the Great Northern Transit Co., the present company's predecessor, he had charge of flagships of the line.

A Buffalo dispatch says that the letting of the contract to dredge out a new passage from Lake Erie into Niagara river appears to commit the government still further to the building of the proposed ship-canal to lower Black Rock along the Niagara, for there is not much other need of the new passage. It will pass the Reading coal dock, but will soon encounter shallow water again. The cut is to be 500 ft. wide and 23 ft. deep, mostly in rock, so there ought to be something to come of it. Nobody seems to doubt that the ship-canal will be built, as it forms the only solution of the Niagara river problem, so long a source of annoyance and loss. The local engineer's office is making the survey this winter, mostly indoors, as there is a large amount of data to work on. The work already let will take four years to complete, there being $200,000 available for it each year.

The ninth lighthouse district, with headquarters at Milwaukee, fares very well in the sundry civil bill recently recommended to the senate. Among the appropriations are items of $100,000 and $75,000 for lighthouse improvements at Milwaukee. The appropriation of $100,000 is to go toward a light and fog signal on the Milwaukee breakwater and $75,000 is for a lighthouse depot for Milwaukee. Other appropriations for improvements in the ninth district are: $75,000 for light tower and fog signal, winter quarters, on Racine reef; $3,500 for building keeper's dwelling for Algoma pier head range light station; $75,000 for light and fog signal station on Fisherman's shoal; $20,000 for light and fog signal on or near Little Gull island, St. Martin's passage, entrance to Green bay; $32,000 for light and fog signal at Pointe au Barques and $6,000 for steam fog signal at Michigan island light station.

TO REVISE BOILER REGULATIONS.

A Commission to Recommend a General Change of Laws of the United States Relating to Construction and Inspection of Marine Boilers, and to Bring About Reciprocal Recognition of Inspection Certificates Between Maritime Nations.

The American Boiler Manufacturers' Association has finally enlisted support of the United States Board of Supervising Inspectors of Steam Vessels, as well as Secretary Shaw of the treasury department and Engineer-in-Chief Melville of the navy, for a bill that is intended to bring about improvement of construction and secure uniformity of inspection of all marine boilers. The measure has been introduced in the senate by Mr. Frye, who is best informed among the senators on shipping subjects, and in the house by Representative John Dalzell. For the present the boiler manufacturers simply ask for the creation of a commission to revise the laws relating to the construction, installation and inspection of steam boilers, this commission to make recommendations to congress. The manufacturers are satisfied that the recommendations of the commission will be made law. They are very anxious, however, that the appointment of the commission by the secretary of the treasury shall be authorized before the adjournment of congress, and Secretary James D. Farasey of Cleveland is now engaged in sending out letters to all the marine boiler manufacturers of the country urging them to recommend passage of the bill to their congressmen. The senate and house bills are, of course, alike in all respects. The senate bill is numbered 7243 and the house bill 17,168. Reference to these numbers is all that is necessary in writing about the bill.

In a letter addressed to Senator Frye and to Representative Dalzell the committee of boiler manufacturers discuss in detail the reasons for asking for a general change in the government regulations regarding marine boilers. The letter which is signed by Col. E. D. Meier, chairman of the committee, is as follows:

"This committee, representing the American Boiler Manufacturers' Association of the United States and Canada, was appointed to confer with the supervising inspectors of steam vessels with a view to obtaining such changes in and additions to the rules of the said service as would make the inspection of marine boilers uniform throughout the United States and bring it into consonance with the present advanced stage of the art. In January, 1902, we met the board, presided over by Supervising Inspector-General James A. Dumont, and had a general and on the whole a very satisfactory discussion of the points at issue. In those matters which it lay in their province to change they met us fairly, assenting to some but refusing others. It appeared, however, that there are a number of matters in which they have no right of initiative but are bound by certain rigid provisions of law. These, no doubt, represented at the time they were framed the best knowledge of the art and of the existing conditions of manufacture. But many of these provisions have become antiquated and therefore work hardships. In some cases the law actually militates against the best modern materials and practice.

"The necessity has therefore arisen for many amendments of and additions to the existing law. As both law and rules have been built up piecemeal, there is no longer a regular or natural sequence, and it frequently occurs that one paragraph conflicts with another, making a correct decision difficult, both for manufacturer and inspector, and thus defeating one of the prime intentions of the law, that of creating uniformity in manufacture and inspection. The principal points to be covered are about the following:

"Uniformity in rules should be so complete that a boiler builder in one part of the United States may build boilers for delivery to a vessel in another part, and our standards should be as far as possible made to agree with those of the foremost European countries, so that the boilers of a vessel of one nation may be repaired and inspected in the ports of another without prejudice. The materials of construction should be specified and tested according to the most advanced modern standards of engineering, so that the best materials may be recognized at their full value. A precise, correct and uniform rule as to factors of safety should be embodied in the law. Not only is this not the case now, but certain of the provisions of the law in this respect are not and never have been complied with, and the law should be amended to recognize the practice which has grown up and is proved correct by the constantly increasing safety of our steamboat service.

"Closely allied with the foregoing are questions of various kinds of riveted joints and the hydrostatic pressure used in acceptance tests. When the law was framed most vessels on the coast and lake service had low-pressure boilers and even on the Mississippi river pressures rarely reached 150 lbs. At present 200 lbs. and over are used. Better riveted joints have been developed and their extra strength should be recognized in the law; and there is not only no necessity but an element of danger in carrying the hydrostatic test pressure to such extreme as the present law makes necessary. As such questions as areas of safety valves and of connecting pipes and legs between boilers are also affected by these higher pressures, the very rules which for ancient conditions promised safety tend to danger under these new conditions.

"Finally an entire rearrangement of the sections of the law seems necessary. Thus questions of design should come first, next materials and their inspection, then tests and factors of safety, then methods of workmanship and finally matters of location, connections and accessories, and all conflicting sections should be harmonized.

"In discussing this matter in its general aspects with Supervising Inspector-General James A. Dumont we learned that it is not in his province to appoint a permanent committee from among his supervising inspectors to take up these matters jointly with this committee, so that although we find him heartily in accord with us in the desire to improve the law, he could not take any initiative in the matter. Manufacturers of boiler materials have also a great interest in this. It would be only fair to have them equally represented in the discussion. Other interests also should be heard in the matter. After fully weighing all these points this committee has concluded that the only way to harmonize all interests and to produce a law fully up to the modern standards of our manufacturing industries would be to ask you to take steps toward the creation of an expert committee or commission, representing all interests concerned to investigate the matter in all its bearings, to weigh the opinions of all and finally to prepare a comprehensive bill. We are gratefully aware of the intelligent interest you have always shown in matters pertaining to our marine service, and therefore place the matter in your hands with perfect confidence. While the law thus perfected would be a statute for marine boilers only, it would command such respect as a standard as would make it the natural basis for uniform state and municipal regulation of boiler construction, and thus its benefits would be indirectly extended to the whole country."

Among the boiler manufacturers who presented the foregoing letter to Senator Frye and Representative Dalzell and who were also instrumental in securing the co-operation of the supervising inspectors, of Secretary Shaw and of Rear Admiral Melville were Col. E. D. Meier of the Heine Safety Boiler Co., New York; James Lappan, James Lappan Mfg. Co., Pittsburg; Richard Hammond, Lake Erie Boiler & Engineering Works, Buffalo; Henry J. Hartley, superintendent for Cramps, Philadelphia; John O'Brien of the John O'Brien Boiler Works, St. Louis; Capt. T. Rees, James Rees & Sons Co., Pittsburg; William Fletcher, W. & A. Fletcher Co., Hoboken, N. J.; Stevenson Taylor, W. & A. Fletcher Co., Hoboken, N. J.; James T. Boyd, constructing engineer of the Atlantic Works, East Boston; George N. Riley, mechanical engineer of the National Tube Co., Pittsburg; James D. Farrasey of the H. E. Teachout Boiler Works, Cleveland, secretary of the association. The title of the bill is "a measure to increase the efficiency and safety of the mercantile marine of the United States, and to appoint a commission to recommend to the congress the revision of all laws of the United States relating to the construction, installation and inspection of marine boilers and their appurtenances, and to suggest the enactment of such additional legislation as will effect improvement in construction of marine boilers and maintain uniformity of inspection of marine boilers in all portions of the United States and insular possessions, and to further provide a reciprocal recognition of boiler inspection certificates between the several maritime nations having marine-inspection laws." The text is as follows:

"Sec. 1. That the secretary of the treasury is hereby empowered and directed to appoint a commission of not less than seven members, representing commercial, manufacturing, maritime and military interests, whose duty it shall be to recommend to the congress such changes in the revised statutes of the United States as will bring about the improvement of construction, and secure a uniformity of inspection of all marine boilers and their appurtenances. It shall be likewise the duty of the commission to recommend such changes in the law as will bring about a reciprocal recognition of boiler inspection certificates between the several maritime nations having marine inspection laws, thus preventing the shipping industry of the country from being subjected to vexatious and costly delays in foreign harbors resulting from the incongruous laws of the several maritime countries appertaining to the construction, inspection and operation of marine boilers.

"Sec. 2. That this commission shall be appointed by the secretary of the treasury, and they shall submit to him a preliminary report on or before the first day of November, 1903. That the expense of printing such a report shall be chargeable to the appropriation created by this act. That any interested parties making official request for such document shall be furnished a copy by the treasury department. That all interested parties shall have an opportunity to submit to the commission any protest, suggestion or recommendation in regard to changes or amendments that should be made in the preliminary report. That the commission shall carefully consider such protest, suggestion or recommendation before making their final report to the secretary of the treasury for transmission to the congress. Such report shall be submitted to him on or before Feb. 1, 1904. That this commission is further empowered to advertise in technical papers, employ technical experts and clerical assistants; likewise to conduct any experiments and tests.

"Sec. 3. That in order to defray the expense attendant upon the duties and labor of such commission the sum of $25,000,000 is hereby appropriated out of any money in the hands of the treasurer of the United States not otherwise appropriated. That the salaries of those members of the commission not holding official

positions under the government shall be determined by the secretary of the treasury."

The approval of the supervising inspectors of steam vessels was secured during the recent meeting of the supervising board and is in the form of a resolution, presented by Robert S. Rodie, supervising inspector of the second district, and unanimously adopted by the board. The resolution says: This board recognizes the force and fairness of the proposed changes in the boiler law of the inspection service and pledges its hearty assistance and co-operation."

PROGRESS ON NAVAL VESSELS.

The monitors, torpedo boats and torpedo boat destroyers, which have for so long been on the list of vessels under construction for the United States navy, must soon be taken from the list as completed. There will then be a marked reduction in the number of vessels building for the navy but not in value, as the larger ships that are being ordered make up for many times their number of smaller craft. The latest monthly summary of progress given out by the navy department is as follows:

Name.	Building at	Degree of completion. Per Cent. Jan. 1.	Feb. 1.
	Battleships.		
Missouri.....	Newport News Co.	81	84
Ohio.....	Union Iron Works	58	69
Virginia.....	Newport News Co.	14	18
Nebraska.....	Moran Bros. Co.	13	15
Georgia.....	Bath Iron Works	19	20
New Jersey.....	Fore River Ship & Engine Co.	23	26
Rhode Island....	Fore River Ship & Engine Co.	23	26
Connecticut.....	Navy Yard, New York	1	1
Louisiana.....	Newport News Co.	1	1
	Armored Cruisers.		
Pennsylvania....	Cramp & Sons	40	42
West Virginia...	Newport News Co.	42	44
California.....	Union Iron Works	18	20
Colorado.....	Cramp & Sons	44	46
Maryland.....	Newport News Co.	41	43
South Dakota...	Union Iron Works	18	22
	Protected Cruisers.		
Denver.....	Neafie & Levy	86	86
Des Moines.....	Fore River Ship & Engine Co.	78	79
Chattanooga.....	Lewis Nixon	68	68
Galveston.....	Wm. R. Trigg Co.	66	66
Tacoma.....	Union Iron Works	61	64
Cleveland.....	Bath Iron Works	91	91
St. Louis.....	Neafie & Levy	13	14
Milwaukee.....	Union Iron Works	9	10
Charleston.....	Newport News Co.	23	27
	Monitors.		
Nevada.....	Bath Iron Works	99	99
Florida.....	Lewis Nixon	96	97
	Torpedo Boat Destroyers.		
Hopkins.....	Harlan & Hollingsworth Co.	95	95
Hull.....	Harlan & Hollingsworth Co.	97	99
Lawrence.....	Fore River Ship & Engine Co.	99	99
McDonough.....	Fore River Ship & Engine Co.	98	98
	Torpedo Boats.		
Stringham.....	Harlan & Hollingsworth Co.	98	98
Goldsborough...	Wolff & Zwicker	99	99
Blakely.....	Geo. Lawley & Son	99	99
Nicholson.....	Lewis Nixon	98	98
O'Brien.....	Lewis Nixon	98	98
Tingey.....	Columbian Iron Works	85	90
	Submarine Torpedo Boats.		
Plunger.....	Lewis Nixon	99	99
Grampus.....	Union Iron Works	91	92
Pike.....	Union Iron Works	85	88
Porpoise.....	Lewis Nixon	99	99
Shark.....	Lewis Nixon	98	98
	Steel Tugs.		
Steel Tug.....	Navy Yard, Boston	2	10
Steel Tug.....	Navy Yard, Mare Island	0	0

CANALS OF FRANCE

Opponents of the plan to improve the Erie canal to 1,000-ton barge capacity maintain that canals are out of date, are no longer effective competitors of modern, well-managed railways, and that a mistake would be made in spending a large sum of money for their improvement. But these men cannot be familiar with the history of canal development abroad where industrial competition has long been fierce and where the inland transportation problem has come to have a more vital bearing upon the daily life of the people than here where the country's resources are as yet but half developed.

It has been found by those who have investigated the European canals in person that, so far from being decadent devices during the last thirty years of peace, they have been constantly enlarged, extended and improved. Great sums of money have been spent for this purpose, and the results have justified the expenditure. Railroad rates in Europe are higher than in America, and have been so for a number of reasons which in time will operate to prevent further reduction of rates here. In Europe there is little of the long-haul traffic, which is so much less expensive to carry than the freight which is hauled over short distances. The result has been, naturally, to bring out the advantages of waterway transportation concurrent with the development of railway lines.

In France, since the war with Prussia, according to Gen. Greene's report of 1899, over 400 miles of new canals and nearly 500 miles of new river navigation have been constructed, bringing the total length of internal waterway communications up to almost 7,000 miles. In the same thirty-year period the water traffic increased 140 per cent. while the traffic by rail increased only 75 per cent. Intelligent, shrewd management, and a willingness on the part of the government to spend money for improvement brought about this result.

France's little neighbor, Belgium, has spent since 1860 more than $50,000,000 in enlarging its canal system, and this result was shown: From 1888 to 1896 the country's water traffic increased nearly 40 per cent. An interesting and significant feature of this gain was that in the single item of package freight (a class of goods presumably destined for swifter railway carriers) the increase during that period was 54 per cent.

From statistics published in France in 1898, the following table, showing the whole extent of that country's water traffic, with its various sub-divisions, is taken:

Lines.	Length in kilmtrs.	Tonnage.
Mons (Paris to Belgian frontier).....	284	2,108,289
Branch of Mons to Charlevoi.....	125	817,785
Oise and Meuse	208	411,999
Escaut—North sea	221	5,051,596
Branch to Belgian frontier	250	1,243,789
Branch of Mons to Bay of Somme.....	156	270,166
Paris to Eastern frontier	494	1,719,718
Givet to Carre	432	1,782,576
Rhone—Rhine	186	144,155
Connection (east and north)	106	136,667
Manche—Mediterranean	1,354	6,686,249
Branch to eastern line	163	92,350
Marne—Seine	186	317,812
Seine—Loire	182	395,031
Lateral line to Loire river	275	581,364
Saone—Loire	116	956,849
Ocean to Mediterranean	609	1,337,658
Rhone to above	116	158,323
Lines of southwest	221	95,879
Lines of Berry	323	793,071
Total (principal lines)	6,007	25,101,326
Secondary (feeder) lines	6,252	5,507,900
All lines	12,259	30,609,226

On all of these lines the kilometric tonnage reached the high figures 4,365,814,460 in comparison with a kilomteric tonnage on the railways of 13,217,000,000. But it must be remembered that the total mileage of railways in France is more than three times as great as that of the waterways. France has been as progressive in keeping its canals up to date as any country, and it is there that the latest mechanical devices for hauling have been adopted. Special Commissioner Witherbee said on this subject:

"A great deal has been done on the French canals within the last few years to develop some sort of mechanical haulage. Three systems have been tested—the cable system, running along the bank of the canal to which the boats can be attached, the use of electric motors on the boats themselves and the use of locomotives running along tracks on the towpaths. All these systems have proved more or less of a failure, but a new system consisting of a machine known as the 'electric horse,' a sort of automobile, which moves along the towpaths without rails and drags the boat, has been tested thoroughly at Bauvin on the northern canal system, not far from Lille, and it is expected that this system will solve the problem of mechanical traction.

"The 'electric horse' resembles very closely one of the small mechanical rollers used in making roads and pavements. The wheels are broad, so as to overcome any inequality or moisture of the towpath. Each machine weighs about 2½ tons, and is capable of drawing three boats with a load of, say, 750 tons, at a speed of 1¼ miles an hour. It is expected that the speed can be greatly increased and the price of traction be greatly reduced, for under the system, improved as I saw it, the rate had already fallen from 2 mills to 1.1 mills per ton mile. The experiments made at Bauvin and at Bethune have been so satisfactory that a plant is being constructed to handle all the traffic on this one canal—the most important in France. It is worth noting that coal is transported to Paris—a distance of 200 miles—for $1.10 per ton.

BRITISH NAVAL POLICY.

Sir William Laird Clowes is proving an able champion of the war ship construction policy of Mr. Philip Watts, the present chief constructor of the British navy. In a recent article he says:

"For nearly twenty years we have followed the ship building policy which I have ventured to associate with the name of Sir W. H. White, and today we have, in consequence, a huge and formidable fleet which, I verily believe, will do very well in future warfare if only our enemies will show themselves as anxious to get at our bluejackets as our bluejackets will be anxious to get at them. The existing fleet, too, can, I think, be trusted to take as good as it can give in the matter of hard knocks. That, however, I venture to assert, is not enough to insure the safety of the empire. We want ships, which as I have said, can catch the foe and then cook him, and which can neutralize such defensive shortcomings as must attach to the best compromise of the naval architect by the overwhelming manner in which they can attack. Mr. Watts, as judged by his performances when at Elswick, is of this opinion. Since he has been in the admiralty he has done nothing to show that he has changed his mind. On the contrary, his designs for the new armored cruisers of the Duke of Edinburg class seem to indicate that he is persisting sturdily, and it is because I know how strong are the influences and prejudices in the other direction, and because I feel that this question of ship building policy is just now a vital one, that I desire to enlist support for the principles which, rightly or wrongly, I associate with his name.

"I believe that Mr. Watts's designs for our next battleships have not yet been made public, and that our battleships now under construction all owe their design to Sir W. H. White. So far as I can ascertain, our only battleships built or building which have a designed speed of upward of 18 knots (and this does not in any case exceed 19 knots) are the vessels of the Canopus, Duncan, Centurion and King Edward VII. classes, and we are constructing no more 19-knot battleships. The new German battleships of the Wittelsbach class have a designed speed of 19 knots; the new American battleships of the New Jersey class also have a designed speed of 19 knots, and of two types of new Italian battleships, one, the Benedetto Brin, has a designed speed of twenty, and the other, the Regina Elena, a designed speed of no less than 22 knots. Of course the fighting value of a battleship depends upon other factors as well as upon speed, one of the chief factors being gun power; and it would be manifestly unfair to award unhesitating and wholesale condemnation to the British ships if it could be shown that, though inferior, or, in a few cases, barely equal, in speed to their foreign rivals, they were, weight for weight, largely superior in gun power. I admit this, in spite of my very strong belief that, as a general rule, it is better to have superior speed and slightly inferior gun power than inferior speed and slightly superior gun power. But what is the fact?

"It is difficult briefly to convey a comprehensive idea of the gun power of a ship; but, perhaps, as good a way as any is to set forth the weight of the projectiles per ton of displacement which can be discharged simultaneously by the guns (small weapons excluded) of the vessel. The following table then, dealing with the various battleships which I have mentioned above, gives, in addition to their displacement in tons and their designed speed in knots, the weight of metal per ton of displacement that can be thrown by each of them at a single discharge of all large guns, together with the total weight of metal so thrown:

Class of battleship.	Displacement in tons	Speed, knots	Weight (in pounds per ton of displacement) of double broadsides	Weight in pounds of double broadside
Canopus, British	12,950	18.2	.355	4,600
Centurian, British	10,500	18.5	.285	3,000
Duncan, British	14,000	19.0	.328	4,600
King Edward VII., British	16,350	18.5	.362	5,920
Wittelsbach, German	12,000	19.0	.290	3,480
New Jersey, American	15,000	19.0	.440	6,600
Benedetto Brin, Italian	13,427	20.0	.405	5,440
Regina Elena, Italian	12,625	22.0	.350	4,420

"I have compared the published specifications and plans of the King Edward VII. with those of the New Jersey, but I fail to discover any particulars, even defensive ones, in which the former are conspicuously superior to the latter, and I take it as certain that if any unprejudiced naval officer were asked whether in war time he would prefer to command one rather than the other he would declare in favor of the American ship. In view of what is being done abroad, it ought to be accepted as an axiom that every future British battleship of 14,000 tons displacement or upward should be able to throw at least .400 lb. of metal per ton, and at the same time should be at least as fast as any battleship of the same size elsewhere existing.

"My objections to our newest and most costly battleships arise out of the fact that they are neither fast enough nor sufficiently gunned. The case of our latest armored cruisers (with the possible exception of Mr. Watts's new vessels) is somewhat different. Upon the whole, they are for the present fast enough to compete in the matter of speed with the corresponding vessels of the other powers, but in the matter of gun power they are even more strikingly defective than are the battleships. Their gun weakness, indeed, is so pronounced as to neutralize almost entirely the speed superiority which some of them possess. Here is a table, drawn up as before:

Class of armored cruiser.	Displacement in tons	Speed, knots	Weight (in pounds per ton of displacement) of double broadside	Weight in pounds of double broadside
Duke of Edinburg, British	13,500	22.5	.242	3,280
Drake, British	14,100	23.0	.179	2,528
Cressy, British	12,000	21.0	.177	2,128
Devonshire, British	10,500	23.0	.146	1,544
Kent, British	9,800	23.0	.155	1,520
California, American	13,400	22.0	.284	3,816
Asama, Japanese	9,750	22.0	.250	2,544
O'Higgins, Chile	8,500	21.2	.251	2,149

"It should be borne in mind that these large armored cruisers are designed to fulfill a twofold purpose. While intended to serve as scouts, collectors of intelligence and commerce destroyers, they are also planned, so that in case of need, they may 'lie in the line' in company with the regular batleships. If, of course, an armored cruiser be very conspicuously deficient in gun power, she is unfit for even occasional employment in the line of battle, and becomes merely a cruiser burdened with armor. Judged by this test, our Drakes, Cressys, Devonshires and Kents, with their feeble broadside weight of metal, must be regarded as comparative failures. The ships of the Duke of Edinburg class (Mr. Watts's new design) promise to be much more successful, but I cannot help beliveing that, had the director of naval construction been encouraged to do so, he could have planned an armored cruiser no bigger than the Drake, yet with better speed and gun power than the California, and with as good defensive qualities as the Duke of Edinburg. In view of what is being done abroad, it ought to be accepted that every new British armored cruiser of 13,000 tons displacement or upward should be able to throw at least .300 lb. of metal per ton, while the present superiority of speed should not be surrendered.

"In the matter of ordinary cruisers—cruisers, that is, without external vertical armor, save in the shape of gun shields—our inferiority is much more conspicuous and startling. Once more I give a brief illustrative table, premising that the British cruisers named in it are the best of that class we possess.

Class of unarmored cruiser.	Displacement in tons	Speed, knots	Weight (in pounds per ton of displacement) of double broadside	Weight in pounds of double broadside
Powerful, British	14,200	22.0	.179	2,552
Ariadne, British	11,000	20.7	.160	1,768
Blake, British	9,000	22.0	.216	1,952
Encounter, British	5,600	22.0	.213	1,196
Brooklyn, American	9,215	21.0	.295	2,720
Esmeralda, Chile	7,000	22.2	.299	2,098
Bogatyr, Russian	6,500	23.0	.206	1,344
Takasago, Japanese	4,300	22.5	.225	1,014
Buenos Ayres, Argentine	4,500	24.0	.242	1,090

"These are the vessels which are intended primarily for watching and keeping track of a mobile enemy, for harrassing hostile commerce, for chasing and capturing torpedo boat destroyers, hired fast steamers, and other speedy but unarmored and ill-gunned craft, and for executing sudden raids. Yet we do not possess a single unarmored cruiser of any size which, even on paper, is capable of steaming at a speed of 23 knots, while, at the same time, our best unarmored cruisers are more feebly gunned than their faster foreign rivals. I do not here discuss the wisdom or otherwise, of building large unarmored cruisers. I desire merely to point out that if we do build unarmored leviathans like the Ariadne, we should at least engine them and gun them so as to render them, tonnage for tonnage, a match for comparatively small foreign craft like the Takasago and the Buenos Ayres. We can do it; for both the Takasago and the Buenos Ayres were designed by Mr. Watts, and built in England. Indeed, I feel sure that Mr. Watts, with a free hand, can give us 24-knot unarmored cruisers, of 11,000 tons or upward which shall throw .300 lb. of metal per ton of displacement, and, so long as we build big unarmored cruisers, we ought to be content with nothing inferior.

"Of late we have built much larger ships than the majority of the other naval nations, ut hitherto we seem to have derived no advantage from having done so. Large ships are more costly and easier to hit than smaller ones, and only when they are actually faster, and relatively, as well as actually, better gunned than the smaller ones, are they desirable. If speed only be aimed at, a comparatively small craft, say of 3,000 tons, can be en-

dowed with the needful engine power and sea-keeping qualities. If gun power, as well as speed, be aimed at, and especially if armor be superadded, great size may be not only excusable, but also necessary. But it is mere wastefulness to build gigantic war ships which, in their most important offensive qualities, are either absolutely or relatively inferior in a glaring degree to foreign vessels, and I trust that Mr. Philip Watts's accession to the post of director of naval construction signifies that we shall build no more of them."

TRIBUTE TO ABRAM S. HEWITT.

At the last meeting of the board of directors of the United States Steel Corporation the following resolutions in honor of Abram S. Hewitt were adopted:

"Abram Stevens Hewitt was born in Rockland county, N. Y., on July 31, 1822. He died in the city of New York on Jan. 18, 1903. During the long period of his activity, which continued till this year, he was surpassed by no citizen of the republic in the variety and value of his contribution to the astonishing development of its moral and material resources. A student, a publicist and a spokesman for his people in their manifold relations, whether in or out of public office, he attained and held a position both lofty and unique. Chief magistrate of his city, and for many years its foremost representative in congress, his public career and utterances justly commanded attention in this land and in foreign lands as well. But here and now it is proper that special recognition be made of the important relation that he bore to the iron and steel industries of the United States.

"From his early manhood Mr. Hewitt was associated by marriage and in business with Peter Cooper, the friend of man, whose philanthropies and affairs engaged and received Mr. Hewitt's sympathetic and active support, and for more than fifty years the firm name of Cooper, Hewitt & Co. has held high place among the active and progressive iron workers of the Atlantic coast. In the rolling and wire mill erected for this business in the city of New York before 1845, anthracite coal was first applied successfully to the puddling of iron. In 1845 was erected at Trenton, N. J., the largest rolling mill in the United States for the manufacture of railway iron, and here for the first time were rolled wrought iron beams for fireproof buildings. Of these buildings the very first, begun by Peter Cooper in 1854, was that splendid institution in the city of New York 'devoted forever to the union of art and science in their application to the useful purposes of life,' known as Cooper Union, to which from its foundation to the day of his death Mr. Hewitt and his family have given without stint their service and their fortune.

"As the representative and spokesman of the iron workers of this country, Mr. Hewitt early and often was called before the public. At the outbreak of the civil war he became the chosen adviser of President Lincoln, with reference to the supply of iron and arms from European sources. In 1880, in the house of representatives, he brought home to the nation the great part borne by the invention of Sir Henry Bessemer, in the mighty expansion in that year of our industrial forces. In 1883, at the opening of the Brooklyn bridge, he delivered an oration unequalled before or since as an eloquent and philosophic exposition of the importance and achievements of the iron workers of America. In 1890, before the great gathering of American and British engineers, he made an address commemorative of Alexander B. Holley, and his introduction and adaptation of the Bessemer process in America, and an exhibition of results which won for him, the first an only American to receive it, the gold medal of the British Iron and Steel Institute, and the concession of its president, Sir Ramsay Watson, that for the first time America had surpassed Great Britain in its output of pig iron. His very last public utterance was a remarkable letter in October, 1902, in commendation of the career of John Fritz of the Bethlehem Steel Co. This splendid record, perfect as it is, attests the pre-eminent position of Mr. Hewitt as the public representative of the iron industry of America.

"Into the organization and development of the United States Steel Corporation Mr. Hewitt entered with all the enthusiasm of his nature and devoted to its affairs his high intelligence and careful scrutiny. He was present at all but four of the meetings of the board beginning with the first. In December, 1902, he made what then was feared, and the event proved to be his last appearance. At every meeting he was vigilant and attentive and his keen scrutiny and shrewd suggestions were of great and lasting value to the conduct of our most important business. Missed as he will be from the councils of many societies, political, philanthropical, educational and financial, nowhere will it be more difficult to fill the place of Mr. Hewitt than in this body, peculiarly representing his life's work, of which with a sincere and respectful admiration this brief minute is made by his fellow members of the board of directors of the United States Steel Corporation."

WANTS A CONTINUING NAVAL PROGRAM.

Representative Dayton of West Virginia, the ranking Republican member of the committee on naval affairs, introduced in the house of representatives lately a resolution providing for the adoption of a continuing program of naval development. It is Mr. Dayton's opinion that the present method of determining from year to year the number of vessels to be added to the navy, taken in connection with the parliamentary exigencies which sometimes necessitate important changes in the navy department plans, is unscientific and results in the expenditure of large sums of money without adequate returns, and in the development of the navy in an unsymmetrical and illogical manner. He therefore proposes that a general plan shall be adopted similar to that now in vogue in several European countries, under which congress shall at once authorize the construction year by year of certain vessels, the number and character of which shall be determined after careful investigation. The text of Mr. Dayton's resolution follows:

"Whereas, In view of the fact that the battleships of modern construction are necessary for the first line of defense of nations possessing a long line of coast, or great commercial or maritime interests, and this question having already been considered at the naval war college and by the general board of the navy, of which Admiral Dewey is president, reports of which have been prepared.

"Resolved, That the secretary of the navy be requested to transmit immediately to the congress the recommendations of the said general board and the reports of the naval war college in reference to the continued naval policy that should be pursued by congress in making appropriations whereby the strength of the navy could be brought to a condition within a fixed period that would make it strong enough to cope on our own or insular shores with any possible combination that is likely to be formed, taking into consideration the commercial rivalry that exists between other powers.

"That the secretary of the navy be particularly requested to inform the congress the appropriations necessary to annually increase the navy to the extent of four battleships, this increase to be in addition to that necessary to provide for deterioration or for loss in strength resulting from wreckage or from striking from the naval register crafts of obsolete design.

"That the secretary of the navy be further requested to inform the congress the additional appropriations necessary to maintain these ships in efficient condition, such appropriations to provide for the pay of additional officers and men needed, and for the establishment of necessary dry docks, slips, accessories requisite for the repair and preservation of the fleet projected.

"That in order to provide ways for obtaining additional officers the secretary be requested to furnish congress with his opinion as to the wisdom and practicability of admitting the elect of the technological schools of the country as ensigns on probation, such graduates at the end of two years to pass a professional and physical examination, to be prescribed by the secretary, before being made commissioned officers of the service."

In the opinion of the general naval board a yearly ship building program of four first-class battleships, two armored cruisers and such smaller craft as are deemed necessary should be authorized by congress in case action is taken as the result of Mr. Dayton's resolution as given above. Secretary Moody received a letter from the house committee on naval affairs inclosing a copy of the Dayton resolution requesting information from the secretary with reference to a permanent program of increase. The committee inquired if the matter at any time recently had been considered by the general board and whether it would be incompatible with public interest for the department to furnish its views and recommendations on the subject. In reply Secretary Moody stated that the question of a steady building program had been given careful consideration by the general board and that he could see no reason why its conclusions should not be transmitted to congress. Although the report has not yet been made to the house, it is learned that the views of the members of the general board as to a yearly increase are in line with the details given above. It is estimated that in case such a program were agreed to by congress it would be necessary to increase each year the number of enlisted men by about 3,500 and the number of commissioned officers by about 180.

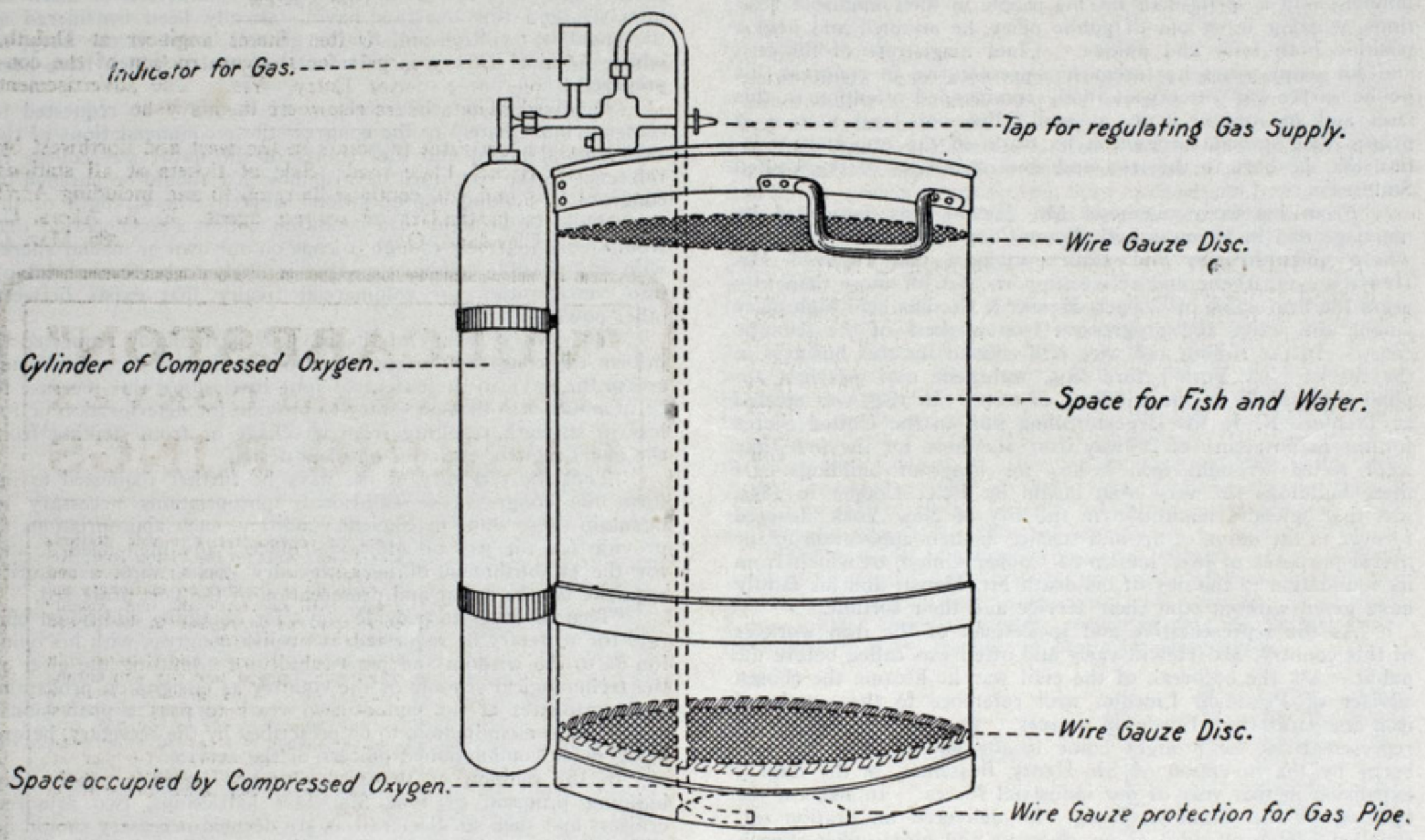
The naval board of construction and repair has made its recommendations to secretary Moody regarding the characteristics of the two new gunboats, Dubuque and Paducah, the construction of which was authorized during the last session of congress. The board recommends that the vessels be improvements on the Wheeling type. They will be of 1,000 tons displacement and carry six 4-in. guns, six 10-pounders and two 1-pounders. The vessels will be designed especially for service in the rivers and harbors of South and Central America. Proposals for their construction will be asked for by the navy department in a few days.

Nicholas J. Quirk, the Chicago marine artist, has just sent out a wash drawing of a yacht in which the effect of substance and motion is accentuated by the use of a die to raise the surface of the paper. The effect is to give body to the hull and to fill the sails with wind. The result is quite novel and satisfactory.

SWISS DEVICE FOR CARRYING LIVE FISH.

Henry G. Morgan, United States consul at Lucerne, transmits to the state department at Washington, an account of a Swiss device for carrying live fish. It would seem upon a superficial view to have commercial advantages, in that it permits the sale of live fish upon the market. Mr. Morgan says:

"I give herewith a diagram of a device patented by Gmur, Maurer & Wiget of Lucerne for the transportation of live fish. The cylinder attached is charged with compressed oxygen, and automatically allows the required amount of gas to descend, by means of a tube, under a very fine wire gauze, which is a little above the bottom of the barrel or cask. The pressure of the oxygen keeps the water from entering the space between the screen and the bottom of the barrel, and allows only a small portion of the oxygen to penetrate at a time. The gradual escape into this space is greater than the outlet through the wire gauze, with the result that when the space becomes greatly charged with oxygen gas, and the force of the water above is no longer able to hold it, it rushes into the tank or barrel with such force that the fish are turned over and over. The most delicate fish can



be packed in these tanks in great quantities and will keep alive for thirty-six hours with the present device; but it is expected that with a larger cylinder of oxygen, the length of time will be increased. Shell fish and eels could be packed like sardines in a tin. As the cylinder containing the compressed oxygen gas works automatically, no care is required during the transportation of the casks. Large quantities of brook trout and other fish are being sent from Switzerland to other parts of Europe by means of this device, and as an illustration of the advantages of being able to transport the fish alive, Messrs. Gmur, Maurer & Wiget inform me that in Vienna, for instance, they receive 75 cents per pound for live brook trout, whereas for the dead ones they receive only 28 cents. The firm has in construction several large tank cars with cylinders attached, to enable them to transport a greater quantity of live fish."

NEW YORK NEWS NOTES.

New York City, Feb. 11.—The United States Ship Building Co. has received contract to build a second car float for the New York, Philadelphia & Norfolk Railroad Co., to be 340 ft. in length, 48 ft. 3 in. wide and 12 ft. 6 in. depth, similar to one they are already building. The float will be built at the Harlan & Hollingsworth company's works at Wilmington, Del., and will cost about $100,000.

Samuel Holmes, well known broker for the building, chartering, buying and selling of steamships and kindred properties, with offices at 66 and 68 Broad street, New York, has issued his twenty-fifth annual, steam vessel circular, containing, besides his views on the present aspect of American ship building and ownership, an extensive list of all manner of steam craft he has got for sale and charter. It is but necessary to state that the reputation of this house, gained in past business deals, is a guarantee of fair and liberal treatment for future patrons.

The Patton Paint Co. of Milwaukee, Wis., has invaded the east and erected one of the largest and best-equipped paint factories in the world at Riverside, on the banks of the Passaic, Newark, N. J. In making this move the Patton company has absorbed the H. W. Johns Paint Mfg. Co. of New York. This concern is only new as relates to Newark and the east in general, as the Patton Paint Co. was established by James E. Patton forty years ago in Milwaukee. This industry is but another evidence of the way the great and growing west is invading the east and infusing new American life and vigor into the business of this section of the country. The buildings of the company were designed and erected under the supervision of Messrs. Hooper & Co., architects and engineers, and the time from breaking ground until active operations were begun has been but six months. It is needless to say that this has been an object lesson the east, in establishing the fact that when it comes to American enterprise and push the great west is the portion of the United States to be reckoned with. Mr. J. S. Mowry, who was general manager of the H. W. Johns Paint Mfg. Co., is the general eastern manager of the Newark plant, with Mr. Charles A. Funk, superintendent. The company manufactures both ready-mixed and plastic paints and will be second at present only to the parent house in Milwaukee, which turns out 100 tons of paint per day, and in the near future promises to outstrip not only its parent but any other paint producing plant in the country. Among the many special paints manufactured are several for marine purposes, chief among which is their "smoke-stack" paint, the name of which indicates its uses.

DEATH OF REAR ADMIRAL WILDES.

Rear Admiral Frank Wildes of the United States navy died suddenly on board the steamship China, en route home from the Philippines, last week. He had a splendid career in the navy, having just relinquished the command of the Aisatic squadron. His promotion from the rank of captain followed closely upon his conspicuous conduct in the battle of Manila, May 1, 1898. He was at that time the captain of the cruiser Boston and remained about the Philippines until the Spanish surrender, on Aug. 13. He was detached and ordered home on Nov. 6, 1898, and was sent to the navy yard in Brooklyn, April 1, 1899. He had since that time been in the Philippines. His period of service there was scheduled to end Dec. 22, 1902. He attained the rank of rear admiral in October, 1901.

Rear Admiral Wildes was born in Boston, June 17, 1843. He came of a family of fighters, his great-grandfather, Brig. Gen. Solomon Lovell of Weymouth, having commanded the defenses of Boston during the revolution, and his grandfather, Capt. William Wildes, having been a lieutenant of the old frigate Boston. His maternal grandfather, Ithamar Rice, participated in the fight at Lexington. Wildes was graduated from the naval academy on May 28, 1863, and was appointed an ensign. He participated in the battles of Mobile and the naval battery under Admiral Farragut until the surrender of Fort Morgan. On Mar. 12, 1868, he was promoted to the rank of lieutenant commander, and on Aug. 1, 1868, was stationed on the steam sloop Pensacola. During April 1880, and while doing ordnance duty at Cold Springs, Wildes was promoted to the position of commander. From 1882 to 1885 he was on the Yantic, on the

North Atlantic squadron. He was at the Portsmouth navy yard from 1885 to 1888.

In one instance, and prior to his conspicuous service at Manila, Capt. Wildes, then commanding the Boston, received high praise for his judicious action at Corea, in January, 1893, when he refused to land troops for the protection of the king.

NEW TYPE OF BRITISH BATTLESHIP.

According to a statement in the London papers the superiority of armament which the United States navy has admittedly held for ten years will be surpassed by battleships, the construction of which is about to be begun in Great Britain. It is stated that the admiralty program for 1903 has been completed and that it includes a new type of battleship, designed by Mr. Watts, director of naval construction, which will exceed those in existence both in size and power. Probably three of these vessels will be laid down. The displacement of each will be 18,000 tons, which is nearly 2,000 tons more than the largest battleship in existence. Each will carry four 12-in. and eight 9.2-in. guns, all in turrets, besides ten 6-in. rapid-fire guns. The speed will be 19 knots. Practically the whole hull will be armored. The principal feature by which it is said these vessels will eclipse American warships is the provision for twelve heavy armor-piercing guns, themselves well protected by armor. In addition to the battleships, six cruisers of 13,000 tons each will be built. These will have a speed of 22 knots. They will carry six 9.2-in. guns and a number of smaller ones. Naval men are enthusiastic over the effectiveness of the 9.2-in. gun. It throws a 380-lb. shot, and can be fired two or three times a minute. The projectile will penetrate 33 in. of iron.

REVISED COST OF 1,000-TON BARGE CANAL.

Revised estimates made by New York state officials have raised the cost of the proposed 1,000-ton barge canal from $82,000,000 to $105,000,000, and the ultimate cost of the improvements, including the sinking fund requirements and the interest on the bonds, to $261,000,000. The figures upon which these computations are based will probably be laid before the canal committee of the New York state assembly at its second hearing on the canal improvement bill next week. The estimates contemplate the deepening of the Champlain canal to only 7 ft., but provide for an increased supply of water. Whatever the figures may show, however, the 1,000-ton canal bill, it is said, will certainly be passed and the whole project submitted to the people at the election this fall. The Republican leaders are convinced that it will be unsafe to withhold the canal improvement longer from the people and th v are desirous of getting the subject off their hands.

ITEMS OF GENERAL INTEREST.

John C. Howard is the name selected for the steel steamer which the Columbia Iron Works of St. Clair, Mich., is building for the Geo. Hall Coal Co. of Ogdensburg.

Detroit despatches announce that some of the biggest machinery of a pile-driving and dredging kind ever seen in that vicinity is being used by the L. P. & J. A. Smith Co. of Cleveland in preparing ground and slips near Ecorse on the Detroit river for the large ship building plant of the Great Lakes Engineering Works.

The C. O. Bartlett & Snow Co. of Cleveland have lately received an order for their improved common sense conveyor for conveying clinker, capacity 1,750 bbls. per day, from the Bronson Portland Cement Co., Bronson, Mich.; from the Omega Portland Cement Co., Jonesville, Mich., for a similar conveyor; and an order from the Egyptian Portland Cement Co., Detroit, Mich., for a conveyor of 1,000 bbls. capacity.

A Washington dispatch says that the house committee on interstate and foreign commerce has instructed Representative Mann of Chicago to prepare a favorable report on his bill requiring removal of tunnels under the Chicago river on the claim that they are obstructions to navigation. It is said that congressional action regarding the tunnels will not be pushed if municipal authorities of Chicago show a disposition to take hold of the tunnel question.

A catalogue just issued by Alfred B. Sands & Son, 134 Beekman street, New York city, manufacturers of yacht and marine plumbing specialties, is at hand. It is of sixty-three pages, handsomely gotten up and illustrating a full line of pumps for tanks, bilge deck, bath, etc., and also a complete line of closets, both pump and syphon, followed up by folding lavatories in various styles and finish from the mahogany and oak incased lavatory to the nickel-plated copper basin. They also show a line of roll-rim porcelain lavatories, bath tubs, soap cups, tumbler holders, tooth brush holders, towel bars, sponge racks, shower baths, and metal goods in the shape of mooring buoys, tanks, ventilators. etc., etc. The binding is green with handsome design printed in yellow, showing a picture of a yacht. A copy of this catalogue will be sent to all interested parties upon request and upon mentioning the Marine Review.

Capt. D. D. Gaillard, United States engineer at Duluth, will on Mar. 9 open proposals for the construction of the concrete south pier at Superior Entry, Wis. The advertisement calling for proposals appears elsewhere in this issue.

Attractive low rates to points in the west and northwest by way of the Nickel Plate road. Sale of tickets at all stations begins Feb. 15 and will continue daily up to and including April 30, 1903. Get particulars of nearest agent. E. A. Akers, C. P. & T. A., Cleveland, O. 286, Mar. 1.

TRADE NOTES.

The Delaware Marine Supply Mfg. Co. of Wilmington, Del., is installing several large furnaces in its brass foundry in order to rush work on recent contracts for ship fittings and marine hardware. This company's newly-designed one-snap airport is meeting with favor among naval architects, ship builders and yacht owners, and is being installed on a large number of vessels now building.

A new boat works with facilities for building marine and stationary gas engines is being established at Sault Ste. Marie, Mich. The name is the Chippewa Gas Engine & Boat Co. and the officers are W. H. Peck president; C. W. Baldwin, vice-president; C. Churchill, secretary; S. J. Johnston, treasurer; F. H. Hoard, superintendent. The product of the company is to be pleasure craft—launches, row-boats, canoes—but they will also make gas engines as an industry separate from the boats, furnish gas engine supplies, etc. The capital is to be $10,000. They report orders for a 56-ft. twin-screw boat of 32 H. P., a 42-ft. single-screw of 25 H. P., a 40-ft. twin-screw of 16 H. P. (fish boat), a 35-ft. single-screw of 10 H. P., and a 34-ft. single-screw fish boat of 8 H. P., as well as ten 16-ft. launches of ¾ H. P. engines. They propose to carry a full stock of row boats, canoes and boat fittings and to make a specialty of gas engine repairs.

Removal of the Chicago Pneumatic Tool Co.'s Aurora (Ill.) factory to Cleveland and its consolidation with the Cleveland plant has been definitely decided upon. The change will be made in the near future. It is expected that this move will result in increased output with economy of production. In presenting to stockholders the annual report of this company, which is very favorable from a financial standpoint, President J. W. Duntley says: "The outlook for the year 1903 is most encouraging. All indications are that our facilities will be taxed to the utmost to supply the demand for our tools, and, indeed, we scarcely expect to be able to do so without increasing the capacity of some of our plants. The saving effected by the use of pneumatic tools is now so well and generally known that it is unnecessary for our representatives to spend time in explaining this point. They are now recognized as part of the standard equipment of every boiler shop, ship yard, locomotive works, bridge and construction works, and many other lines of manufacture and are being rapidly introduced into stone quarries, mines, etc. Our business for January, 1903, is 50 per cent. ahead of the corresponding month one year ago. While our domestic business is increasing in a gratifying manner, our foreign trade, which showed a remarkable increase during the last six months of 1902, promises even greater increase the coming year."

The pier terminals of the North German Lloyd Steamship Co., nearing completion in Hoboken, mark a new departure in the science of pier construction. The plans of W. F. Whittemore, chief engineer, provide for absolutely fire-proof buildings. A solid sea wall, 900 ft. in length, has been built of granite and concrete. On this foundation a two-story bulkhead building, 850 by 130 ft., has been constructed of steel columns, filled with and surrounded by concrete, held in place by iron jackets. The same material is being used for surrounding the steel girders. Brick arches are used between girders with concrete floors. The sides of the building are of granite and brick with iron doors. The three piers extending from the terminal are 910 by 80 ft., 894 by 80 ft., and 874 by 90 ft. The foundation construction is necessarily of wood piling, on account of the great depth of soft mud and the impact of heavy ocean vessels, which render a rigid construction of stone impracticable. Concrete floors cover the deck of each pier. All steel columns and girders are enclosed with concrete and jackets, as in the bulkhead building. The floors of the piers are divided into three compartments by fire-proof walls with double automatic fire doors. The entire sides of the piers are made up of huge iron doors, operated by an improved device for raising and lowering. Automatic sprinklers to operate at a certain temperature are installed, also an independent system of fire mains and hydrants. The multiphase cable system of automatic alarms, with loose coils of the same cable to lay over stored merchandise, will be used. Numerous improvements for the security and comfort of the passengers are included in the terminal. The entire structural steel and metal work of bulkhead building and piers is protected with Dixon's silica-graphite paint.

ELECTRIC LAUNCHES GROWING IN POPULARITY.

Electric launches have been used by yachtsmen for many years. Those who have large steam yachts have been able to hang them on the davits of their yachts and while they were not in use the dynamo has been charging them with electricity to run them when wanted. These launches were rather expensive at first but now it is understood that many of the troubles that have worked against ther popularity have been overcome and the electric motor for yachting gives more satisfaction than it does in the automobile. The electric boatmen say that as the launch runs quietly through water and does not have to work up and down hill or jolt over uneven roads the power can be used very economically and the launch will run much further than the automobile with the same power. Several of these boats are being built at the works of the Electric Launch Co. at Bayonne. One is for President A. J. Cassatt of the Pennsylvania Railroad Co. and will be used at Bar harbor. This boat is 31 ft. in length. Adolph Lewisohn is having a 36-ft cabin launch built which will be driven by an electric motor. This boat will be used on Upper Saranac lake. R. D. Douglas is having a 25-ft. boat built, which is to be fitted with a half cabin. A 21-ft. launch is also being built as a yacht tender for the steamer Hauoli, which is being built in the Erie Basin for F. M. Smith. This steamer is the largest yacht now being built in this country. At these works several other yachts are being built. W. F. Morgan of Brooklyn is having a 60-ft. gasolene boat built which is to be equipped with two 25-H. P. motors which will drive the boat at the rate of 14 miles an hour. R. Waverly Smith of Galveston has ordered an auxiliary yawl. This boat will be 60 ft. over all, 55 ft. on the waterline, 15 ft. beam and will be equipped with a motor of sufficient power to drive her 7½ miles an hour when the vessel is running under the engine alone. This boat will be very roomy and will have sleeping accommodations for ten. A launch is being built for C. Oliver Iselin for use as a tender to the new cup defender. This boat will be 37 ft. over all, 32 ft. on the waterline, 6 ft. 2 in. beam and 2 ft. draught and will have power enough to drive her 13 miles an hour. Charles Henry Davis was to have had a boat of similar dimensions, but a speed of 17 miles an hour. The plans for this boat are now being changed and it is probable that it will be a much larger craft.

M. Goubet, the inventor of the small submarine boat which bears his name, died in a private hospital in Paris last week. The story of M. Goubet's life is one long record of hope deferred and bitter disappointment and when the inventor could no longer conceal from himself the fact that the original submarine on which he had spent fifteen years was doomed to be rejected by the government the blow effected his health and he gradually gave way to absolute hopelessness.

A dispatch from L'Orient to the Petit Journal of Paris says experiments are being made in one of the basins of the dock yard of a new submarine boat invented by M. Jacob, who designed the model according to the shape of a cetaceous mammal. By the aid of ingenious mechanism M. Jacob has imitated the action of the fins of the cetacae.

The navy department has decided to retain the Philadelphia at Bremerton navy yard as a receiving ship. This vessel was one of the first cruisers of the new steel navy and has become antiquated.

Books on Naval Architecture, Ship Yard Practice, Seamanship, Etc.

AMERICAN MERCHANT MARINE—Winthrop L. Marvin. A history of Am. Ships and Shipping. $2.

AMERICAN PRACTICAL NAVIGATOR---Nathaniel Bowditch. $2.25.

DATA BOOK—Naval architects and engineers' data book. By T. H. Watson. A reliable and simple means of recording valuable data, etc., of vessels and engines. Size of book, 8¾ in. by 5 in., cloth, $2.

ELEMENTARY STEAMSHIP—by Barker. New and enlarged edition. $2 50.

ELEMENTS OF NAVIGATION---Henderson. $1.

HAND BOOK OF ADMIRALTY LAW---Robt. M. Hughes. $3.75.

HINTS ON LEGAL DUTIES OF SHIPMASTERS--- B. W. Ginsburg. $1.75.

ILLUSTRATED NAUTICAL ENCYCLOPEDIA--- Howard Patterson. $3.

INTERNATIONAL SIGNAL CODE—Bureau of Navigation. New Edition. $3.00.

KNOW YOUR OWN SHIP---Thos. Walton. $2.50.

MANUAL OF ALGEBRA---R. C. Buck. For the use, more especially, of young sailors and officers in the merchant navy; numerous examples and exercises. $1.50.

MARINE INSURANCE. W.Gow. $1.50.

MARINER'S COMPASS IN AN IRON SHIP: How to keep it efficient and use it intelligently. J. W. Dixon. $1.

MODEL ENGINES AND SMALL BOATS---N. M. Hopkins. New methods of engine and boiler making; ship design and construction; fifty illustrations. $1.25.

MODERN SEAMANSHIP---Lieut. Com. Austin M. Knight, U. S. N. Adopted as the text book of the United States Naval Academy. $6.

MODERN PRACTICE OF SHIP BUILDING IN IRON AND STEEL---Samuel J. P. Thearle. 2 volumes. Second edition, revised and enlarged. $5.25.

NAVAL ARCHITECTURE: A treatise on laying off and building wood, iron and composite ships. Samuel J. P. Thearle. In two volumes. $3.

NAVAL ARCHITECTURE: A manual on laying off iron and steel vessels---Thos. H. Watson. Valuable for naval architects as well as beginners in ship yards. $5.

NAVAL ARCHITECTURE---Sir W. H. White. New Edition. 750 pages. $9.

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RESISTANCE AND PROPULSION OF SHIPS--- Durand. $5.

RESISTANCE AND PROPULSION OF SHIPS--- By Taylor. $3.75.

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Sent to any address, carriage prepaid, at prices named.

The Marine Review Pub. Co., 39-41 Wade Bldg., Cleveland, Ohio.

U. S. Engineer Office, Grand Rapids, Mich., Jan. 20, 1903. Sealed proposals for repair of piers at St. Joseph and Black Lake, Mich., will be received here until 3 p. m., Feb. 19, 1903, and then publicly opened. Information furnished on application. CHARLES KELLER, Capt., Engrs. Feb. 12.

U. S. Engineer Office, Dulu h, Minn., Jan. 19, 1903. Sealed proposals for pier work and dredging at Port Wing, Wis., will be received here until noon, Feb. 19, 1903, and then publicly opened Information on application. D. D. GAILLARD, Capt., Engrs. Feb. 12.

U. S. Engineer Office, Duluth. Minn., Jan. 24, 1903. Sealed proposals for furnishing and placing about 26,000 tons of riprap at Ashland, Wis., will be received here until noon, Feb. 24, 1903 and then publicly opened. Information on application. D. D. GAILLARD, Capt., Engrs Feb. 19

Sealed proposals will be received at the office of the Light House Engineer, Detroit, Mich., until 3 o'clock p. m. on Monday, March 2, 1903, and then opened, for furnishing the material and labor necessary for removing the wooden superstructure of the foundation pier of the Cheboygan Crib Light Station, Mich., and rebuilding the same in concrete and masonry. Information furnished on application to Captain LANSING H. BEACH, Corps of Engineers, U. S A., Engineer, 11th Light House District. Feb. 19

U. S. Engineer Office, Duluth, Minn., Feb. 5, 1903. Sealed proposals for purchase of U. S. steam yacht "Picket" will be received here until 10 a. m., Feb. 25, 1903, and then publicly opened. Information on application. D. D. GAILLARD, Capt., Engrs. Feb. 19

U. S. Engineer Office, Grand Rapids, Mich., Feb. 12, 1903. Sealed proposals for construction of steel hulled inspection and survey boat will be received here until 3 p. m., Feb. 27, 1903, and then publicly opened. Information furnished on application. CHAS. KELLER, Capt., Engrs. Feb. 19.

Sealed proposals will be received at the office of the Light House Engineer, Buffalo, N. Y., until 12 o'clock m., of Thursday, Mar. 5, 1903, and then opened, for furnishing the materials and labor necessary for the construction of a keeper's dwelling at South Buffalo light station, N. Y., in accordance with specifications, copies of which, with blank proposals and other information, may be had upon application to Major T. W. SYMONS, U. S. A., Engineer. Feb. 26.

U. S. Engineer Office, Grand Rapids, Mich., Feb. 2, 1903. Sealed proposals for repair of piers at Pentwater and White Lake, Mich , and repair of piers and revetment at Charlevoix, Mich., will be recevied here until 3 p.m., March 4, 1903, and then publicly opened. Information furnished on application. CHARLES KELLER, Capt., Engrs. Feb. 26.

U. S. Engineer Office, Milwaukee, Wis., Jan. 31, 1903. Sealed proposals for building crib piers, crib breakwater, pile revetment, removal of portion of old pier, and dredging at Waukegan Harbor, Ill., will be received here until 3 o'clock, p. m., March 2, 1903, and then publicly opened. Specifications, blank forms, and all available information will be furnished on application to this office. J. G. WARREN. Major, Engineers. Feb 26.

U. S. Engineer Office, Milwaukee, Wis., Jan. 31, 1903. Sealed proposals for furnishing Oregon fir timber and plank will be received here until 3 o'clock, p m., March 2, 1903, and then publicly opened. Specifications, blank forms, and all available information will be furnished on application to this office, J. G. WARREN, Major, Engineers. Feb. 26.

U. S Engineer Office, Milwaukee, Wis., Jan. 31, 1903. Sealed proposals for building crib piers at Sheboygan Harbor, Wis., will be received here until 3 o'clock, p. m., March 2, 1903, and then publicly opened. Information furnished on application. J. G. WARREN, Major, Engineers. Feb. 26.

U. S. Engineer Office, Milwaukee, Wis., Jan. 31, 1903. Sealed proposals for building crib breakwater at Manitowoc Harbor, Wis., will be received here until 3 o'clock, p m., March 2, 1903, and then publicly opened. Information furnished on application. J. G. WARREN, Major, Engineers. Feb. 26.

U. S. Engineer Office, Milwaukee, Wis., Jan. 31, 1903. Sealed proposals for dredging and rock removal at Sturgeon Bay and Lake Michigan Ship Canal, Wis., will be received here until 3 o'clock, p. m , March 2, 1903, and then publicly opened. Specifications and all available information will be furnished on application to this office. J. G. WARREN, Major, Engineers. Feb. 26.

U. S. Engineer Office, Duluth, Minn., Feb. 6, 1903. Sealed proposals for dredging about 40,000 cu. yds. at Ashland, Wis., and Ontonagon, Mich., will be received here until 10 a. m., Mar. 9. 1903, and then publicly opened. Information on application. D. D. GAILLARD, Capt., Engrs. Mar 5

U. S. Engineer Office, 57 Park st., Grand Rapids, Mich., Feb. 9, 1903. Sealed proposals for dredging harbors on east shore of Lake Michigan will be received here until 3 p. m., Mar. 11, 1903, and then publicly opened. Information furnished on application. CHAS. KELLER, Capt., Engrs. Mar. 5.

U. S. Engineer Office, Duluth, Minn., Feb. 7, 1903. Sealed proposals for building in place the concrete south pier at Superior Entry, Wis., will be received here until noon, Mar. 9, 1903, and then publicly opened. Information on application. D. D. GAILLARD, Capt., Engrs. Mar. 5.

U. S. Engineer Office, Buffalo, N. Y., Feb, 3, 1903. Sealed proposals for pier extension at Little Sodus Bay, N. Y., and breakwater extension at Cape Vincent, N. Y., will be received here until 11 a. m., Mar. 5, 1903, and then opened; information furnished on application. T. W. SYMONS, Major, Engrs. Mar. 5.

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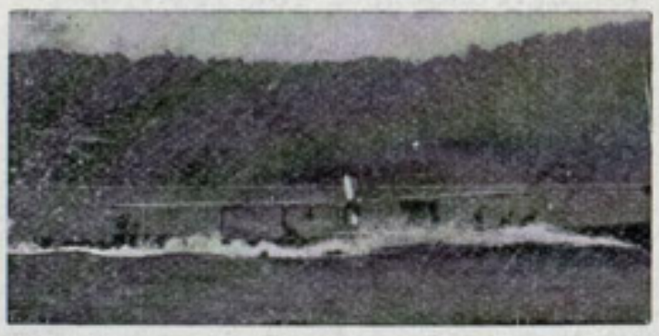

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Marine Review Pub. Co ....Cleveland
Potter, J. D..... .....London

CIRCULATOR, EQUILIBRIUM,

With Steam Heating Attachment.
Bloomsburg & Co., H. .....Baltimore, Md.

CLOCKS (Marine), CHRONOMETERS, BELLS.

Ashton Valve Co. .....Boston.
Bliss, John & Co. .....New York.
Chelsea Clock Co. .....Boston.
Ritchie, E. S. & Sons.....Brookline, Mass.

COAL PRODUCERS AND SHIPPERS.

Castner, Curran & Bullitt .....Boston.
Graham Coal & Coke Co., Ltd.. .....Detroit
Hanna, M. A. & Co. .....Cleveland.
Pickands, Mather & Co. .....Cleveland.
Pittsburg Coal Co. .....Cleveland.
Rochester & Pittsburg Coal & Iron Co. ....Buffalo.

COAL AND ORE HANDLING MACHINERY.

Bartlett & Snow Co., C. O. .....Cleveland.
Brown Hoisting Machinery Co., (Inc.)...Cleveland.
Lidgerwood Mfg. Co.....New York.
Webster, Camp & Lane Co.....Akron, O.

COMPASSES.

Bliss, John & Co. .....New York.
Ritchie, E. S. & Sons.....Brookline, Mass.

CONDENSER TUBE PACKING.

Allen, Joseph .....Collingswood, N. J.

COPPER, TIN AND SHEET IRON WORK.

Lake Erie Boiler Works.....Cleveland.
McCutcheon, C. H.....Buffalo.
Topky Brothers .....Ashtabula, O.

COPPER—SHEET, TUBES AND ROD.

Waterbury Brass Co.....New York.

CORDAGE.

Baker & Co., H. H.....Buffalo.
DeGrauw, Aymar & Co.....New York.
Upson-Walton Co.....Cleveland.

CORK JACKETS AND RINGS.

Armstrong Cork Co. ....Pittsburg, Pa.
Kahnweiler's Sons, D. ....New York.
Lane & DeGroot .....Long Island City, N. Y.

CORRESPONDENCE SCHOOLS.

Chicago Nautical School.....Chicago.

CHAIN CONVEYORS, HOISTS.

Bartlett & Snow Co., C. O. .....Cleveland.
Brown Hoisting Machinery Co., (Inc.)...Cleveland.
Chicago Pneumatic Tool Co. .....Chicago.
General Electric Co. .....Schenectady, N. Y.
Lidgerwood Mfg. Co.....New York.
Railway Appliances Co .....Chicago.
Westinghouse Electric & Mfg. Co. .....Pittsburg.

DEAD-LIGHTS, AIR-PORTS, ETC.

"Long-Arm" System Co. .....Cleveland.

DRAWING MATERIALS.

Schwencke, Kirk & Co.....New York.

DIVING APPARATUS.

Morse, A. J. & Son.....Boston.
Schrader's Son, A. .....New York.

DRILL PRESSES—DRILLS OF ALL KINDS.

Cleveland Punch & Shear Works Co. ....Cleveland.
Railway Appliances Co .....Chicago.

DRYING APPARATUS.

Buffalo Forge Co.....Buffalo.
Sturtevant, B. F. Co. .....Boston.

DRY DOCKS.

American Ship Building Co. .....Cleveland.
Atlantic Works .....East Boston, Mass.
Baltimore Ship Building Dry Dock Co...Baltimore.
Bath Iron Works, Ltd. .....Bath, Me.
Buffalo Dry Dock Co. .....Buffalo.
Chicago Ship Building Co. .....Chicago.
Craig Ship Building Co. .....Toledo, O.
Cramp, Wm. & Sons .....Philadelphia.
Detroit Ship Building Co. .....Detroit.
Harlan & Hollingsworth Co. ....Wilmington, Del.
Lockwood Mfg. Co. .....East Boston, Mass.
Manitowoc Dry Dock Co.....Manitowoc, Wis.
Marine Construction & Dry Dock Co. ....New York.
Maryland Steel Co. .....Sparrow's Point, Md.
Milwaukee Dry Dock Co. .....Milwaukee.
Moran Bros. Co. .....Seattle, Wash.
Newport News Ship Building Co. Newport News, Va.
Nixon, Lewis .....Elizabeth, N. J.
Pusey & Jones Co. .....Wilmington, Del.
Shipowners Dry Dock Co. .....Chicago.
Superior Ship Building Co.....Superior, Wis.

ELECTRIC HOISTS AND CRANES.

Elwell-Parker Electric Co. .....Cleveland.
General Electric Co. .....Schenectady, N. Y.
Lidgerwood Mfg. Co.....New York.
Westinghouse Electric & Mfg. Co. ..Pittsburg, Pa.

ELECTRIC FIXTURES AND APPLIANCES.

General Electric Co. .....Schenectady, N. Y.
Seidler-Miner Electric Co. .....Detroit.
United Marine Mfg. & Supply Co.....New York.
Westinghouse Electric & Mfg. Co.....Pittsburg, Pa.

ELECTRIC LIGHT AND POWER PLANTS.

Buffalo Forge Co. .....Buffalo.
Electro-Dynamic Co. .....Philadelphia.
Elwell-Parker Electric Co. .....Cleveland.
General Electric Co. .....Schenectady, N. Y.
Seidler-Miner Electric Co.....Detroit.
Sturtevant, B. F. Co. .....Boston.
United Marine Mfg. & Supply Co.....New York.
Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

ELECTRIC STEERING GEAR, SPEED AND RUDDER INDICATORS, ETC.

Electro-Dynamic Co. .....Philadelphia.

ENGINE BUILDERS, MARINE.

American Ship Building Co.....Cleveland.
Atlantic Works .....East Boston, Mass.
Bath Iron Works, Ltd. .....Bath, Me.
Bell Engineering Works, David .....Buffalo.
Buffalo Forge Co. .....Buffalo.
Chicago Ship Building Co.....Chicago.
Chase Machine Co. .....Cleveland.
Craig Ship Building Co. .....Toledo, O.
Cramp, Wm. & Sons .....Philadelphia.
Dake Engine Co.....Grand Haven, Mich.
Detroit Ship Building Co. .....Detroit
Fletcher, W. & A. Co. .....Hoboken, N. J.
Fore River Ship & Engine Co.....Quincy, Mass.
Great Lakes Engineering Works.....Detroit, Mich.
Hall Bros. .....Philadelphia.
Harlan & Hollingsworth Co. ....Wilmington, Del.
Jenks Ship Building Co. .....Port Huron, Mich.
Lockwood Mfg. Co. .....East Boston, Mass.
MacKinnon Mfg. Co. .....Bay City, Mich.
Maryland Steel Co. .....Sparrow's Point, Md.
Milwaukee Dry Dock Co. .....Milwaukee.
Moran Bros. Co. .....Seattle, Wash.
Mosher, Chas. D. .....New York.
Neafie & Levy Ship & Engine Bldg. Co. Philadelphia.
Newport News Ship Building Co. Newport News, Va.
Nixon, Lewis .....Elizabeth, N. J.
Pusey & Jones Co. .....Wilmington, Del.
Risdon Iron Works .....San Francisco.
Roach's Ship Yard .....Chester, Pa.
Thropp, J. E. & Sons Co. .....Trenton, N. J.
Sheriffs Mfg. Co. .....Milwaukee.
Superior Ship Building Co.....Superior, Wis.
Trigg, Wm. R. Co.....Richmond, Va.
Trout, H. G. .....Buffalo.
Warrington Iron Works .....Chicago.
Willard, Chas. P. & Co. .....Chicago.

BUYERS' DIRECTORY OF THE MARINE TRADE.—Continued.

ENGINE ROOM TELEGRAPH, CALL BELLS, ETC.

Cory, Chas. & Son .....New York.
Electro-Dynamic Co. .....Philadelphia.
MacLean Hydraulic Signal Co..... ... .Chicago.
Seidler-Miner Electric Co. .....Detroit.

ENGINEERING BOOKS.

Audel & Co., Theo.....New York.
Marine Review Pub. Co.....Cleveland.

ENGINEERING SPECIALTIES AND SUPPLIES.

Crane Co. .....Chicago.
Farnan Brass Works .....Cleveland.
Kieley & Mueller .....New York.
McCutcheon, C. H. .....Buffalo.
New York Belting & Packing Co.....New York.
Reilly Repair & Supply Co., James.....New York.

ENGINEERS, MARINE, MECHANICAL, CONSULTING.

Electro-Dynamic Co. .....Philadelphia.
Garrett-Cromwell Engineering Co.....Cleveland.
Gaskin, Edward .....Buffalo.
Goodenough, Walter .....New York.
Hunt, Robt. W. & Co. .....Chicago.
Kidd, Joseph .....Duluth, Minn.
Logan, Robert .....Cleveland.
Mosher, Chas D. .....New York.
Newman, R. L.....New York.
Pittsburg Testing Laboratory, Ltd.....Pittsburg.
Powell, Ambrose V. .....Chicago.
Roelker, H. B. .....New York.
Sadler, Perkins & Field.....New York.
See, Horace .....New York.
Wood, W. J. .....Chicago.

EVAPORATING AND DISTILLING APPARATUS.

Reilly Repair & Supply Co., James....New York.

FANS FOR VENTILATION, EXHAUST, ETC.

Buffalo Forge Co. .....Buffalo.
Sturtevant, B. F. Co. .....Boston.

FEED WATER PURIFIERS AND HEATERS.

Learmonth, Robert .....Buffalo.
Reilly Repair & Supply Co., James.....New York.
Ross Valve Co. .....Troy, N. Y.

FIXTURES FOR LAMPS, OIL AND ELECTRIC.

General Electric Co. .....Schenectady, N. Y.
Seidler-Miner Electric Co. .....Detroit.
Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

FORGES.

Buffalo Forge Co. .....Buffalo.
Sturtevant, B. F. Co. .....Boston.

FORGINGS FOR CRANK, PROPELLER OR THRUST SHAFTS, ETC.

Cleveland City Forge & Iron Co. .....Cleveland.
Fore River Ship & Engine Co. .....Quincy, Mass.
Macbeth Iron Co. ..... Cleveland.

FLUE WELDING.

Fix's, S. Sons .....Cleveland.

FURNACES FOR BOILERS.

Continental Iron Works.....New York.

FUELING COMPANIES AND COAL DEALERS.

Castner, Curran & Bullitt (Pocahontas) ....Phila.
Graham Coal & Coke Co.....Detroit
Hanna, M. A. & Co. .....Cleveland.
Pickands, Mather & Co. .....Cleveland.
Pittsburg Coal Co. .....Cleveland.
Rochester & Pittsburg Coal & Iron Co. ....Buffalo.
Smith, Stanley B. & Co. .....Detroit.
Youghiogheny & Lehigh Valley Coal Co...Chicago.

GASKETS, RUBBER.

New York Belting & Packing Co.....New York.

GAS BUOYS.

Safety Car Heating & Lighting Co. ..New York.

GAS AND GASOLINE ENGINES.

Chase Machine Co. .....Cleveland.

GAGES, STEAM AND VACUUM.

American Steam Gauge Co. .....Boston.
Ashton Valve Co. .....Boston.

GRAPHITE.

Dixon Crucible Co., Joseph .....Jersey City, N. J.

HAMMERS, STEAM.

Bell Engineering Works, David .....Buffalo.
Chase Machine Co. .....Cleveland.
Railway Appliances Co .....Chicago.

HARDWARE, SHIP.

Topky Brothers .....Ashtabula, O.

HATCH GEARS.

"Long-Arm" System Co. .....Cleveland.

HEATING APPARATUS.

Buffalo Forge Co. .....Buffalo.
Sturtevant, B. F. Co. .....Boston.

HOISTS FOR CARGO, ETC.

American Ship Building Co.....Cleveland.
Brown Hoisting Machinery Co., Inc. ....Cleveland.
Chase Machine Co. .....Cleveland.
Elwell-Parker Electric Co. .....Cleveland.
General Electric Co. .....New York.
Hyde Windlass Co. .....Bath, Me.
Lidgerwood Mfg. Co.....New York.
Marine Iron Co. .....Bay City.
Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

HOLLOW STAYBOLT IRON.

Falls Hollow Staybolt Co.....Cuyahoga Falls, O.

HOSE FITTINGS.

Farnan Brass Works. .....Cleveland.

HOSE, RUBBER.

New York Belting & Packing Co.....New York.

HYDRAULIC MACHINERY.

Watson-Stillman Co., The.....New York.
Wood & Co., R. D. .....Philadelphia.

ICE MACHINERY.

American Linde Refrigerating Co. .....New York.
Roelker, H. B. .....New York.

INDICATORS FOR STEAM ENGINES.

American Steam Gauge Co. .....Boston.
Ashton Valve Co. .....Boston.

INJECTORS.

American Injector Co. ..... Detroit
Crane Co. .....Chicago.
Jenkins Bros. .....New York.
Lunkenheimer Co. .....Cincinnati.
Penberthy Injector Co. ..... Detroit, Mich.

INSURANCE, MARINE.

Brown & Co. .....Buffalo.
Brown, W. W. .....Cleveland.
Dunham, R. J. .....Chicago.
Elphicke, C. W. & Co. .....Chicago.
Hawgood & Co., W. A. .....Cleveland.
Helm & Co., D. T.....Duluth
Hutchinson & Co. .....Cleveland.
Insurance Co. of North America....Philadelphia
McCarthy, T. R. .....Montreal.
McCurdy, Geo. L. .....Chicago.
Mitchell & Co. .....Cleveland.
Peck, Chas. E. & W. F. ...New York and Chicago.
Richardson, W. C. .....Cleveland.
Sullivan, D. & Co. .....Chicago.
Weeks, F. H. .....New York.

IRON ORE AND PIG IRON.

Bourne-Fuller Co. .....Cleveland.
Hanna, M. A. & Co. .....Cleveland.
Pickands, Mather & Co. .....Cleveland.

LATHE, FOR CUTTING PIPE THREADS.

Kent Machine Works .....Brooklyn, N. Y.

LAUNCHES—STEAM, NAPHTHA, ELECTRIC.

Marine Construction & D. D. Co.....
.....Mariner's Harbor, S. I., N. Y.
Warrington Iron Works .....Chicago.
Willard, Chas. P. .....Chicago.

LIFE PRESERVERS, LIFE BOATS, BUOYS.

Armstrong Cork Co. .....Pittsburg.
Drein, Thos. & Son .....Wilmington, Del.
Kahnweiler's Sons, D. .....New York.
Lane & DeGroot .....Long Island City, N. Y.
Marine Construction & D. D. Co, Mariner's Harbor,..... .....S. I. N. Y.

LIGHTS, SIDE AND SIGNAL.

Helvig, H. A. J.....New York.
Russell & Watson .....Buffalo.

LOGS.

Walker & Sons, Thomas .....Birmingham, Eng.
Nicholson Ship Log Co. .....Cleveland.
Also Ship Chandlers.

MACHINISTS.

Chase Machine Co.....Cleveland.
Macbeth Iron Co. .....Cleveland.
Union Machine & Boiler Co.....Cleveland.
Ward Machine Co.....Cleveland.

MACHINE TOOLS (WOOD WORKING).

Atlantic Works, Inc. .....Philadelphia.

MACHINERY, NEW AND SECOND HAND.

Bowler & Co. Geo. H. .....Cleveland.
Clyde Machine Works..... .....Chicago.

MAN-HOLES, SWING DOORS, ETC.

"Long-Arm" System Co. .....Cleveland.

MARINE RAILWAYS, BUILDERS OF

Crandall & Son, H. I. .....East Boston, Mass.

MATTRESSES, CUSHIONS, BEDDING.

Fogg, M. W.....New York.

MECHANICAL DRAFT FOR BOILERS.

American Ship Building Co. .....Cleveland
Bloomsburg & Co., H. .....Baltimore, Md.
Buffalo Forge Co. .....Buffalo.
Detroit Ship Building Co. .....Detroit
Sturtevant, B. F. Co. ....Boston.

METALLIC PACKING.

Allen, Joseph .....Collingswood, N. J.
Hayden Mfg. Co., N. L. .....Columbus, O.
Katzenstein, L. & Co. .....New York.
U. S. Metallic Packing Co. .....Philadelphia.

METAL POLISH.

Bertram's Oil Polish Co. .....Boston.

MOTORS, GENERATORS—ELECTRIC.

Buffalo Forge Co. .....Buffalo.
Electro-Dynamic Co. .....Philadelphia.
Elwell-Parker Electric Co. .....Cleveland.
General Electric Co. .....Schenectady, N. Y.
"Long-Arm" System Co. .....Cleveland.
Seidler-Miner Electric Co. .....Detroit.
Sturtevant, B. F. Co. .....Boston.
United Marine Mfg. & Supply Co.....New York.
Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

NAUTICAL INSTRUMENTS.

Bliss, John & Co. .....New York.
Ritchie, E. S. & Sons .....Brookline, Mass.

NAVAL ARCHITECTS.

Gaskin, Edward .....Buffalo.
Goodenough, Walter .....New York.
Kidd, Joseph .....Duluth, Minn.
Logan, Robert .....Cleveland.
Mosher, Chas. D. .....New York.
Newman, R. L. .....New York.
Sadler, Perkins & Field.....New York
See, Horace.....New York.
Wood, W. J. .....Chicago.

OAKUM.

DeGrauw, Aymar & Co. .....New York.
Stratford Oakum Co.,.....Jersey City, N. J.

OILS AND LUBRICANTS.

Dixon Crucible Co., Joseph .....Jersey City, N. J.
Standard Oil Co. .....Cleveland.

OIL FILTERS.

Haines Co., W. S. .....Philadelphia.

PACKING.

Allen, Joseph .....Collingswood, N. J.
Crane Co. .....Chicago.
Hayden Mfg. Co., N. L. ..... Columbus, O.
Jenkins Bros. .....New York.
Katzenstein, L. & Co. .....New York.
New York Belting & Packing Co.....New York.
United States Metallic Packing Co. ....Philadelphia.

PAINTS.

Baker, Howard H. & Co .....Buffalo.
Berry Bros., Ltd. .....Detroit.
Day's Varnish & Dryer Co. .....Cleveland.
Mohawk Paint & Chemical Co. .....New York.
New Jersey Zinc Co. .....New York.
Topky Brothers .....Ashtabula, O.
Upson-Walton Co. .....Cleveland.

PATENT ATTORNEYS.

Thurston & Bates .....Cleveland

PATTERN SHOP MACHINERY.

Atlantic Works, Inc. .....Philadelphia.

PIPE—BRASS AND COPPER, IRON PIPE SIZE.

Waterbury Brass Co.....New York.

PIPE, WROUGHT IRON.

Bourne-Fuller Co .....Cleveland.
Crane Co .....Chicago.
Macbeth Iron Co..... .....Cleveland.

PLANING MILL MACHINERY.

Atlantic Works, Inc. .....Philadelphia.

PLATE BENDING AND PLANING MACHINES.

Wood & Co., R. D. .....Philadelphia.

PLUMBING, MARINE.

Mott, J. L., Iron Works .....New York.
Reilly Repair & Supply Co., James....New York.
Sands, Alfred B. & Son .....New York.

PNEUMATIC TOOLS.

Allen, John F., ... New York.
Chicago Pneumatic Tool Co. .....Chicago.
Railway Appliances Co .....Chicago.

POLISH FOR METALS.

Bertram's Oil Polish Co.....Boston.

POWER DOORS AND HATCHES.

"Long-Arm" System Co. .....Cleveland.

PRESSURE REGULATORS.

Kieley & Mueller .....New York
Ross Valve Co. .....Troy, N. Y.

BUYERS' DIRECTORY OF THE MARINE TRADE.—Continued.

PROPELLER WHEELS.

American Ship Building Co. .....Cleveland
Atlantic Works .....East Boston, Mass.
Baltimore Ship Building & Dry Dock Co. Baltimore.
Bath Iron Works, Ltd. .....Bath, Me.
Cramp, Wm. & Sons.....Philadelphia.
Detroit Ship Building Co. .....Detroit.
Fore River Ship & Engine Co. .....Quincy, Mass.
Great Lakes Engineering Works.....Detroit.
Hyde Windlass Co. .....Bath, Me.
Harlan & Hollingsworth Co.....Wilmington, Del.
Jenks Ship Building Co. .....Port Huron, Mich.
Lockwood Mfg. Co. .....East Boston, Mass.
Macbeth Iron Co..... Cleveland.
MacKinnon Mfg. Co. .....Bay City, Mich.
Maryland Steel Co. .....Sparrow's Point, Md.
Milwaukee Dry Dock Co. .....Milwaukee.
Moran Bros. Co. .....Seattle, Wash.
Neafie & Levy Ship & Engine Bldg. Co.....Phila.
Newport News Ship Bldg. Co...Newport News, Va.
Nixon, Lewis .....Elizabeth, N. J.
Phosphor Bronze Smel'ing Co., Ltd...Philadelphia.
Pusey & Jones Co. .....Wilmington, Del.
Risdon Iron Works .....San Francisco.
Roelker, H. B. .....New York.
Sheriffs Mfg. Co. .....Milwaukee.
Superior Ship Building Co.....Superior, Wis.
Thropp & Sons Co., J. E. .....Trenton, N. J.
Trigg, Wm. R. Co. .....Richmond, Va.
Trout, H. G. .....Buffalo.

PROJECTORS, ELECTRIC.

Elwell-Parker Electric Co. .....Cleveland.
General Electric Co. .....Schenectady, N. Y.
Seidler-Miner Electric Co. .....Detroit.
Westinghouse Electric & Mfg. Co....Pittsburg, Pa

PUMPS FOR VARIOUS PURPOSES.

Blake, Geo. F. Mfg. Co. .....New York.
Clyde Machine Works..... .....Chicago.
Great Lakes Engineering Works.....Detroit.
Kingsford Foundry & Machine Wks. Oswego, N. Y.

PUNCHES, RIVETERS, SHEARS.

Chicago Pneumatic Tool Co. .....Chicago.

REFRIGERATING APPARATUS.

Roelker, H. B. .....New York.

REGISTER FOR CLASSIFICATION OF VESSELS.

Great Lakes Register .....Cleveland.
Record of American & Foreign Shipping.New York.

RELEASING HOOKS FOR DETACHING BOATS.

Standard Automatic Releasing Hook Co. New York.

RIVETS, STEEL, FOR SHIPS AND BOILERS.

Bourne-Fuller Co. .....Cleveland.

RANGES.

Russell & Watson .....Buffalo.

RIVETS—BRASS AND COPPER.

Waterbury Brass Co.....New York.

RUBBER INSULATED WIRES.

Roebling's Sons, Jno. A...New York and Cleveland.

SAFETY VALVES.

American Steam Gauge Co. .....Boston.
Ashton Valve Co.....Boston.
Hayden Mfg. Co., N. L..... Columbus, O.
Lunkenheimer Co. .....Cincinnati.

SAIL MAKERS.

Baker, Howard H. & Co. .....Buffalo.
Upson-Walton Co. .....Cleveland.
Wilson & Silsby .....Boston.

SALVAGE COMPANIES.

See Wrecking Companies.

SCHOOLS—NAUTICAL, ENGINEERING.

Chicago Nautical School .....Chicago.

SEARCH LIGHTS.

Elwell-Parker Electric Co. .....Cleveland.
General Electric Co. .....Schenectady, N. Y.
Seidler-Miner Electric Co. .....Detroit.
Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

SHEARS.

See Punches, Rivets, and Shears.

SHIP AND BOILER PLATES AND SHAPES.

Bourne-Fuller Co. .....Cleveland.

SHIP BUILDERS.

American Ship Building Co. .....Cleveland.
Atlantic Works .....East Boston, Mass.
Baltimore Ship Building & Dry Dock Co..Baltimore.
Bath Iron Works, Ltd.....Bath, Me.
Bell Engineering Works, David .....Buffalo.
Buffalo Dry Dock Co. .....Buffalo.
Cramp, Wm. & Sons.....Philadelphia.
Craig Ship Building Co. .....Toledo, O.
Chicago Ship Building Co.....Chicago.
Detroit Ship Building Co. .....Detroit.
Fore River Ship & Engine Co. .....Quincy, Mass.
Great Lakes Engineering Works.....Detroit.
Harlan & Hollingsworth Co. .....Wilmington, Del.
Jenks Ship Building Co. .....Port Huron, Mich.
Lockwood Mfg. Co.....East Boston, Mass.
Manitowoc Dry Dock Co.....Manitowoc, Wis.
Marine Construction & Dry Dock Co.....
.....Mariner's Harbor, S. I., N. Y.
Maryland Steel Co .....Sparrow's Point, Md.
Milwaukee Dry Dock Co.....Milwaukee.
Moran Bros. Co. .....Seattle, Wash.
Neafie & Levy Ship & Engine Bldg. Co.....Phila.
Newport News Ship Bldg. Co....Newport News, Va.
Nixon, Lewis .....Elizabeth, N. J.
Pusey & Jones Co. .....Wilmington, Del.
Risdon Iron Works .....San Francisco.
Roach's Ship Yard .....Chester, Pa.
Smith & Son, Abram .....Algonac, Mich.
Trigg, Wm. R. Co. .....Richmond, Va.
Warrington Iron Works .....Chicago.
Willard, Chas. P. & Co. .....Chicago.

SHIP CHANDLERS.

Baker, Howard H. & Co. .....Buffalo.
Moran Bros. Co. .....Seattle, Wash.
Reilly Repair & Supply Co., James....New York.
Upson-Walton Co. .....Cleveland.

SHIP LANTERNS AND LAMPS.

Helvig, H. A. J.....New York.
Page Bros. & Co.....New York.
Russell & Watson.....Buffalo.

SMOOTH-ON COMPOUND, FOR REPAIRS.

Smooth-On Mfg. Co. .....Jersey City, N. J.

SPARS—LARGE SIZES.

Moran Bros. Co.....Seattle, Wash.

STAYBOLTS, IRON OR STEEL, HOLLOW, OR SOLID.

Falls Hollow Staybolt Co.....Cuyahoga Falls, O.

STEAM VESSELS FOR SALE.

Elwell, Jas. W. & Co.....New York.
Holmes, Samuel.....New York.
King, Rufus S.....New York.
McCarthy, T. R.....Montreal, Can.
Newman, R. L.....New York.
Weeks, F. H.....New York.

STEAMSHIP LINES, PASS. AND FREIGHT.

American Line.....New York.
International Nav. Co.....Philadelphia.
Pere Marquette R. R. & S. S. Line.....Milwaukee.
Red Star Line.....New York.

STEEL CASTINGS.

Seaboard Steel Casting Co.....Chester, Pa.
Macbeth Iron Co..... Cleveland.

STEERING APPARATUS.

American Ship Building Co.....Cleveland.
Chase Machine Co. .....Cleveland.
Dake Engine Co.....Grand Haven, Mich.
Detroit Shipbuilding Co.....Detroit.
Electro-Dynamic Co.....Philadelphia.
Hyde Windlass Co.....Bath, Me.
Jenks Ship Building Co.....Port Huron, Mich.
Queen City Engineering Co.....Buffalo.
Sheriff Mnfg. Co.....Milwaukee.

STOCKS, BONDS, SECURITIES.

Brown, W. W.....Cleveland.
Fahey & Co.....Cleveland.

SUBMARINE DIVING APPARATUS

Morse & Son, A. J.....Boston.
Schrader's Son, A.....New York.

SURVEYORS, MARINE.

Goodenough, Walter.....New York.
Gaskin, Edward.....Buffalo.
Newman, R. L.....New York.
See, Horace.....New York.
Wood, W. J.....Chicago.

TESTS OF MATERIAL.

Hunt, Robert W. & Co.....Chicago.
Pittsburg Testing Laboratory, Ltd.....Pittsburg.

TILING, INTERLOCKING RUBBER.

New York Belting & Packing Co.....New York.

TOOLS, METAL WORKING, FOR SHIP AND ENGINE WORKS.

Allen, John F. .....New York.
Chicago Pneumatic Tool Co.....Chicago.
Railway Appliances Co .....Chicago.
Watson-Stillman Co.....New York.

TOOLS, WOOD WORKING.

Atlantic Works, Inc.....Philadelphia.

TOWING MACHINES.

American Ship Windlass Co.....Providence, R. I.
Chase Machine Co.....Cleveland.

TOWING COMPANIES.

Donnelly Salvage & Wrecking Co....Kingston, Ont.
Midland Towing & Wrecking Co., Ltd.Midland, Ont.

TRAPS, STEAM.

Haines Co., Wm. S.....Philadelphia.
Kieley & Mueller.....New York.

TRUCKS.

Boston & Lockport Block Co..... .....Boston.

TUBING, SEAMLESS.

Benedict & Burnham Mnfg. Co....Waterbury, Conn.
National Tube Co.....Pittsburg.
Waterbury Brass Co.....New York.

VALVES, STEAM SPECIALTIES, ETC.

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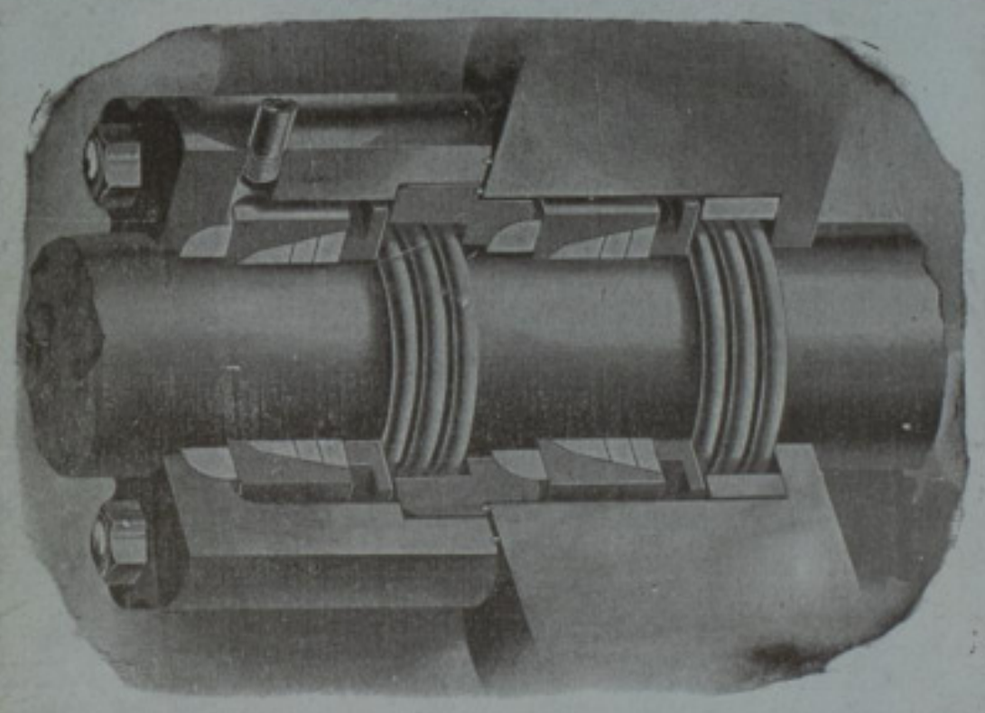

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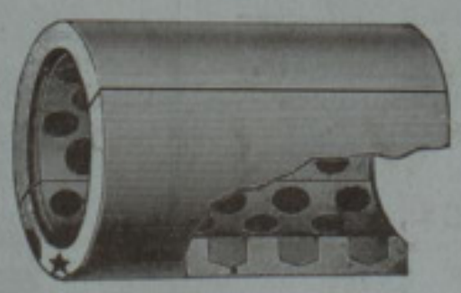

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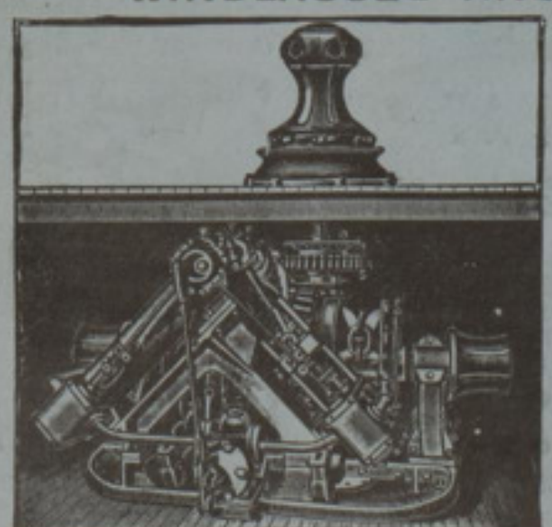

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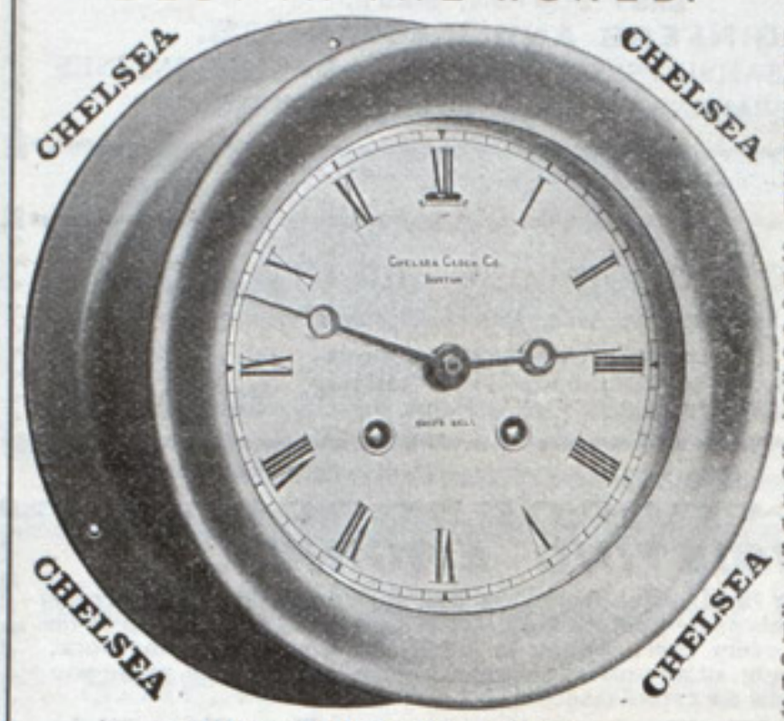

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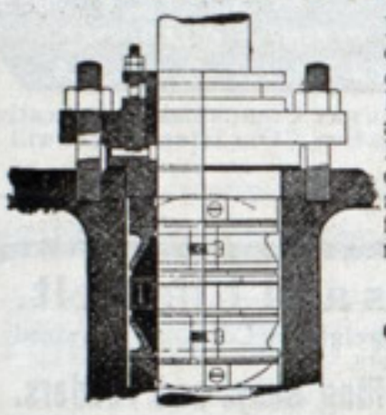

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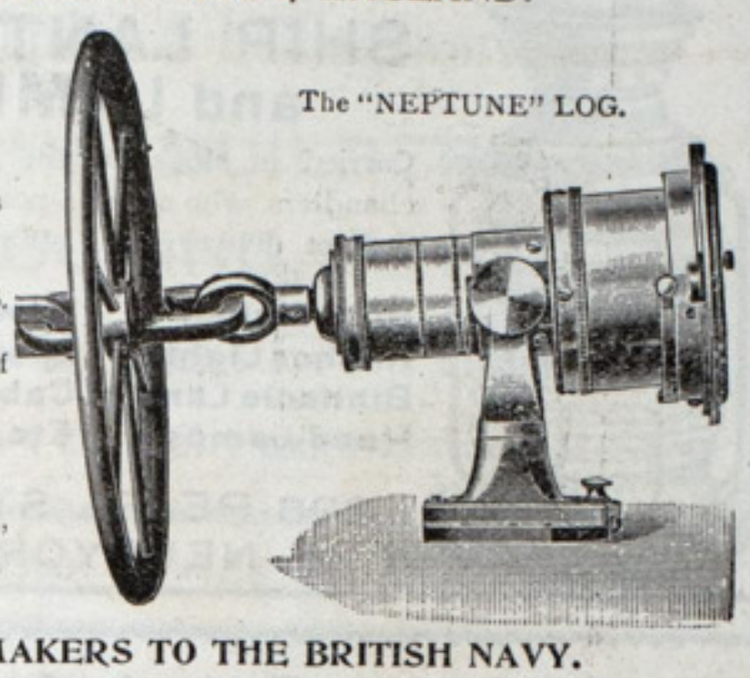

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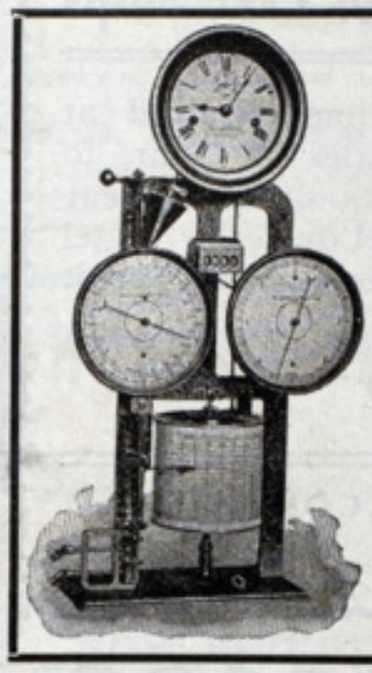

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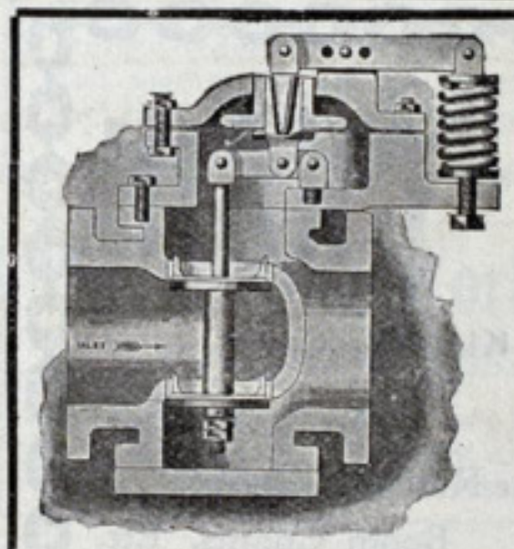

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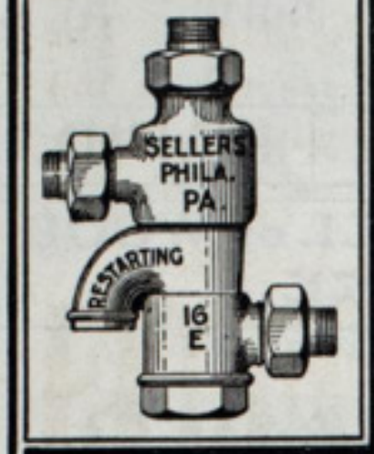

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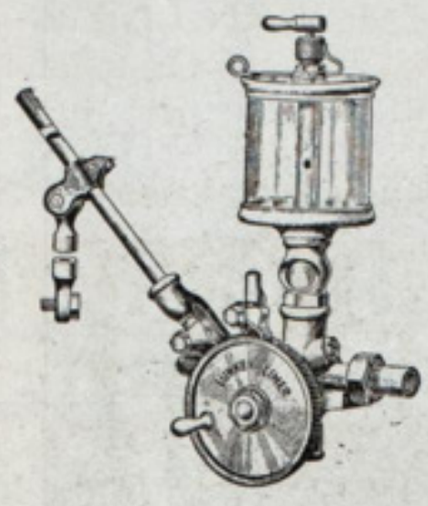

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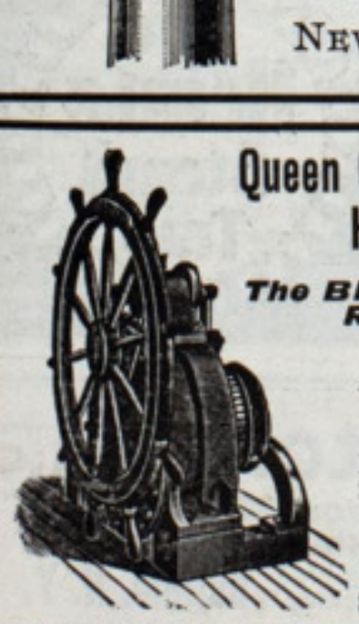

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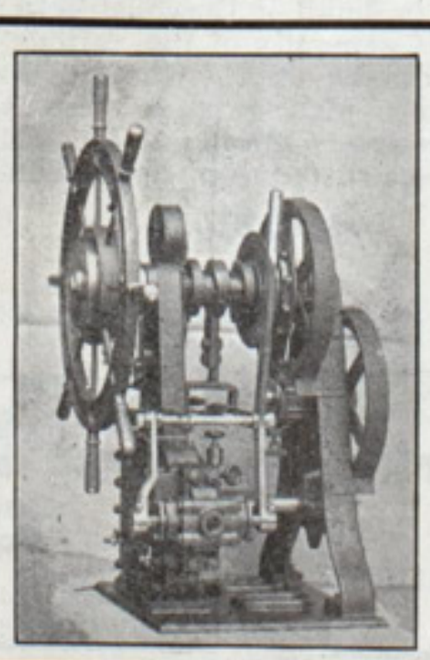

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